Original Research Article

The Impact of Covid 19 on The Income and Expenditure of the Egyptian Family: A Case study of Gharbia Governorate.

ABSTRACT

This research paper aims at studying and analyzing expenditure of the family on food and non-food commodities for various family income levels in the rural and urban areas of Gharbia Governorate in Egypt, during the spread of the newly discovered corona virus, and monitoring the consumer's purchasing behaviors according to the current economic and social situations and also monitoring the most important ways and methods used by the family to face this pandemic and it's effect, By evaluating the effect of corona pandemic it's clear that the number of families whose income decreased during the pandemic in the sample of the rural and urban areas in Gharbia governorate is about 85, 149 families, and the categories that are harmed the most by the pandemic are those who work in professions with unfixed payment and they represent 60.9% of the total number of families in the sample which reached 384 families, the most important reasons to the decrease of the household income are : the cessation of work of one of the family members, to imposing the precautionary measures, the stoppage of work of some of the family members, the decrease of the demand on the activity, low wages, decreasing work days and hours and irregular work, while some families dealt with this decrease through some necessary measures such as: dispensing with some quantities of unnecessary commodities when their price rises, and also some families relied in their consumption on what can be planted or raised at home or receiving subvention from the Egyptian government during the stoppage of work which represents about 74.4%, 55.7%, 3.1% respectively of the total research sample.

Keywords: Income; Expenditure; Covid 19; Size effect; The expenditure flexibility; Marginal propensity to consume.

1. INTRODUCTION

Like many other countries Egypt has been on full alert to control the spread of the corona pandemic through taking several urgent measures such as imposing restrictions on the activities of many economic centers, banning the transportation of individuals inside and outside the country in addition to all the protective health measures and on the 14th of February 2021 the Egyptian authorities have declared the discovery of the first case infected with the virus among the citizens within the country an Egyptian man who returned from abroad, Thus, the situation of the spread of the Corona virus (Covid-19) on the international aspect since it appeared even 31 December 2021, the number of cases all over the world has reached about (288.32) million confirmed cases, about (253.65) recoveries cases, about (5.45) million cases of death, meanwhile the number of confirmed cases in Egypt reached about (385.58) thousand confirmed cases, about (320.56) thousand recoveries cases, about (21.75) thousand cases of death (Information, Support and Decision – Making center in the Egyptian Cabinet, 31/12/2021) .

By monitoring the changes in the Egyptian society as a result of the **precautionary measures imposed by the Egyptian government to limit the spread of corona pandemic** we find that the Egyptian society has gone through two phases the first is the phase of social stillness and apathy which was before the appearance of corona pandemic and the second is the phase of panic and change in the consumers behavior which was during the spread of corona and this makes us study the effects of the spread of corona pandemic on the income and the consumer spending on food and non-food commodities and it's effect on the consumption pattern of the Egyptian family especially with the income inequalities in Egypt.

2. RESEARCH PROBLEM

The research problem is represented in stating the most prominent measures taken by the Egyptian government to face the virus and it's effect on different life aspects starting from health care and fear of infection to the challenges of distance working and studying, the suffer of workers and those who work in craft occupations from the partial lock down, the decrease of working hours, the low payment and the closure of some activities which lead to the decrease income of the Egyptian family members during the spread of corona virus and therefore it's effect on the level of spending on food and non-food commodities and this may differ from a commodity to another and from a place to another according to the importance and the

priority of this commodity compared to other commodities, this difference is due to the clear variation in the distribution of income on the members of society which lead to the change in the consumption pattern, the decrease of the purchasing power, the decrease of savings and the increase of burdens on the families with limited income which leads to the depletion of the excreted efforts to achieve the economic and social progress goals.Goals of the research

3. GOALS OF THE RESEARCH

The research aimed at studying and analyzing expenditure of the family on food and non-food commodities for various family income levels in the rural and urban areas of Gharbia Governorate, during the spread of the newly discovered corona virus, and monitoring the consumer's purchasing behaviors according to the current economic and social situations and also monitoring the most important ways and methods used by the family to face this pandemic and it's effect on the family income during the period (1\2\2019-31\1\2021) and this is done through:

- Recognizing the characteristics of the research sample in Gharbia Governorate.
- Assessment of the impact of Covid 19 on the monthly income and expenditure of the family compared to the period before.
- Studying the most important factors affecting the monthly household expenditure in the research sample in the rural and urban areas of Gharbia Governorate before and during the widespread of corona pandemic.

4. METHODOLOGY AND DATA SOURCES

(Socio-Economic) study was done for the phenomenon of the effect of wide spread of corona pandemic on the income and expenditure the families in Gharbia Governorate before and during the outbreak of corona pandemic through the descriptive and quantitative analysis methods as Kolomogrov-Smirnov and Shapiro-Wilk tests were applied using SPSS program to ascertain the nature of data and whether or it follows the natural distribution?

The research also aimed at estimating the size effect as a complementary method to test the hypotheses through clarifying some statistical indications that are used to indicate the size effect value and accordingly the importance of the size effect comes from covering the deficiencies concerning the research hypotheses as a result of relying on the traditional statistical indication methods as the statistical significance levels of the tests refer to how reliable the achieved results are irrespective of the size of the differences or the strength of connection to these results and they are directly affected by the sample size while the size effect measures (practical implication) aren't affected by the sample size and it refers to the size of the differences or the strength of the connections between the variables without paying attention to the reliability (Mohamed, 2011), and the idea of the practical implication or Size Effect is based on the formulation of the differences between those averages using standard deviation as a measuring unit of the value of the differences between those averages or to express the relation between the independent variables on one hand and the dependent variables on the other hand (Cohen, 1988), by using the variation size of the dependent variable which can be explained through the independent variable as it is with the variation analyses and one of the most important used indications are (η^2) and Cohen indication (d) to measure size effect (Fagley & Mckinney, 1983), and table(1) show using T-Test Paired Samples Statistics for tribal and remote measurements, Independent Samples T-Test, the multiple regression of the relation between the household expenditure and both the total income and the family size in rural and urban areas before and during the pandemic was estimated in it's double algorithmic form (Spss) statistical program.

Table 1. Methods for calculating the effect size of the emergence of corona pandemic for the research sample.

Name of value	Code	Formula	Statistical significance test	Value explanation	
				Value	Evaluation
D- Cohen	d	$\frac{M_{group1} - M_{group2}}{SD_{pooled}}$	The difference between the means of the two related samples	0.20 0.50 0.80	Small Middle large
Eta squared	η^2	$\frac{T^2}{T^2 + df}$	The difference between the means of the two independent samples	0.01 0.06 0.14	Small Middle large

Source: Cohen, J. (1988). Statistical power analysis for the behavioral sciences. Hillsdale, NJ: Erlbaum.

Where: M_1, M_2: indicate the arithmetic averages before and during corona pandemic.

SP: the standard deviation of the variations.

T^2 : the calculated squared value of (T) test.

df: the number of free degrees.

5. THE RESEARCH SAMPLE

The research relied on the primary data collected using a form specially prepared for this research that was selected randomly, from a deliberate sample of the study population. The data were collected every month for 24 months. The study included two periods, the first period was before the emergence of Covid 19 from (1\2\2019 - 31\1\2020) and the second during the spread of Covid 19 from (1\2\2020 - 31\1\2021).

The first stage: random sampling method was selected based on the relative importance of the number of families in urban and rural centers in Gharbia Governorate. It was found that the number of families in rural and urban areas amounted to about 939.99, 405.21 thousand families, representing about 69.8%, 30.1% of the total number of families in the governorate, which is about 1.345 million families, and the average number of family members in rural and urban areas was 3.88, 3.7 individuals (Gharbia Governorate, Egypt, 2019), Two centers of Gharbia Governorate were identified according to the relative importance of the number of families and population, which are the centers of Al-Mahalla Al-Kubra and Tanta, and the number of respondents was from Al-Mahalla Al-Kubra and Tanta Centers, About 192 families out of the total number of respondents set by law to be about 384 views[1], A random sample has been chosen from the families in the villages and cities through in Al-Mahalla Al-kubra and Tanta centers, the biggest villages in rural areas as well as the biggest areas in the urban areas were chosen according to the relative importance of the number of families in the 2 centers.

The second stage: a purposive sample was chosen, as the study population was divided into 3 categories according to the total household income per month in rural and urban areas of the 2 centers (Mahalla al-Kubra, Tanta) the number of families in rural and urban areas reached about 110, 274 families. The first category (less than 5000 LE) includes 52 families, the second category (5000 to less than 9000 LE) is about 30 families, and the third category (greater than 9000 LE) includes 28 families in the countryside, and in contrast the number of families in the urban area is 170, 64, 40 families of income groups, respectively.

6. RESEARCH RESULTS AND DISCUSSION

6.1 The Characteristics of The Research Sample in Gharbia Governorate

The families size reached about 1894 individual in the sample under study including about 569 members in the rural areas and about 1325 members in the urban areas of Gharbia Governorate.

The number of the family people with a fixed salary (employees in the governmental sector or those who have a pension) about 174 male heads of household while the number of people with a non-fixed salary reached about 257 male heads of household as they work in several activities such as: craftsman, driver or people who work in a supermarket, cafe, farm, restaurant or those who are engaged in a commercial activity or day to day work with a percentage of 17.4%, 7.7%, 8.4%, 5.9%, 21.3%, 4.9%, 24% respectively of the total sample.

6.2 The results evaluating the effects of the Corona pandemic on the research sample according to the graphs in Gharbia Governorate

Figure (1) showed a 61% decrease in the family income while those whose income increased represent 9% of the total sample during the outbreak of the Corona Virus pandemic.

Figure (2) shows the reasons for the decline in income as follows Precautionary measures, Working in favor of fewer hours and days, Intermittent work, Decreased demand for activity, Some people stopped working, Project paused, Employer reduced wages by 21%, 20%, 19%, 16%, 10%, 8%, 3%, 2% respectively of the total sample.

Figure (3) the percentage of family members who stopped working during the corona period in the total sample showed about 31%, it was also clear that only 3.1% of the total sample was supported by the state during the widespread spread of corona.

[1]- Steven K. Thompson, (2012) Law: $n=\frac{N\times p\,(1-p)}{[\,N-1\times (d^2\div z^2)]+p\,(1-p)}$

Whereas:

n: indicates the number of respondents. N : indicates the size of the community.

d : indicates error rate = 0.05. z : refers to the standard level corresponding to the indication level 0.95= 1.96.

P : refers to the percentage of availability of the feature and neutrality =0.50.

Figure (4) shows the variation in how food commodity needs are purchased weekly, every 3 days, daily, and monthly during the spread of the Corona virus is about 54%, 33%, 7%, 6%, respectively.

Figure (5) shows that the percentage of those who rationalized their commodity consumption during the spread of the Corona virus is about 73%, while the percentage of those who dispensed with some unnecessary commodity quantities is about 75% of the total sample, while the percentage of those who relied on what can be It is grown or raised at home only about 18% of the total number of families of the interviewed people.

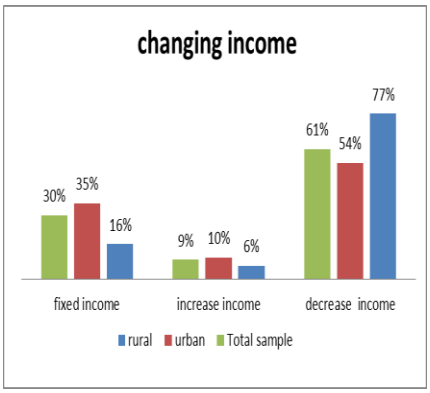
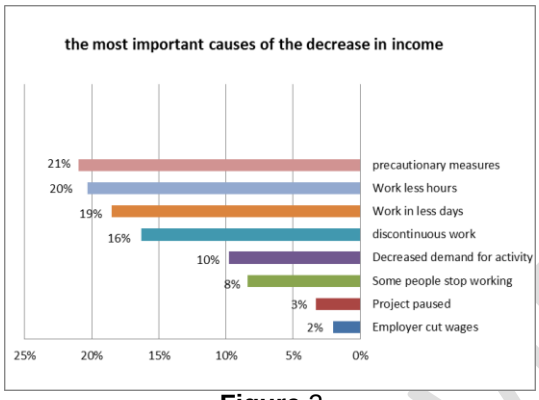


Figure 1.



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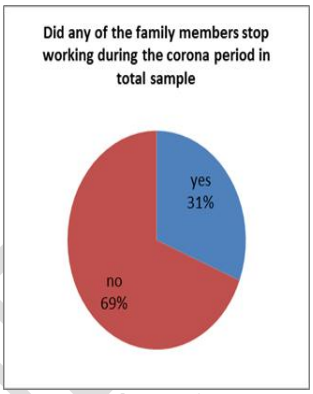

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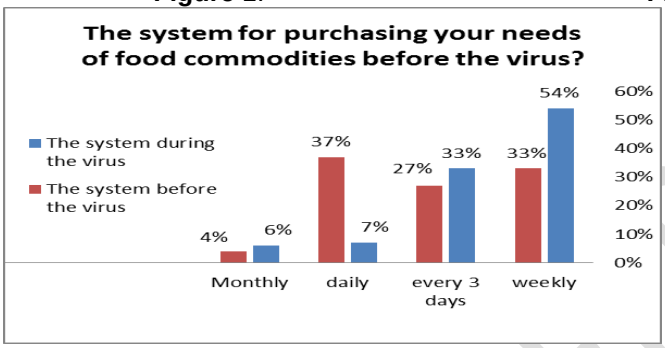

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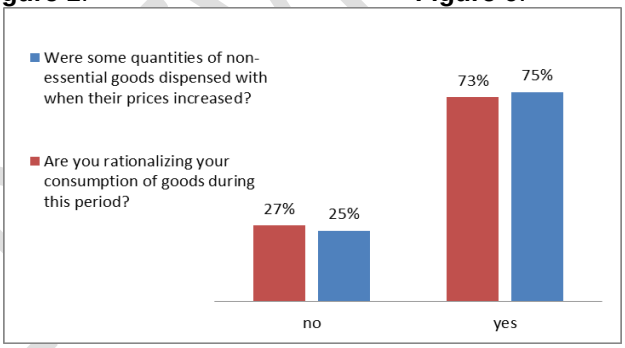

Figure 5.

Source: The results of the research sample data in Gharbia Governorate for (2019/2020)(2020/2021).

6.3 THE STRENGTH OF THE STATISTICAL TESTS AND THE SIZE EFFECT OF CORONA PANDEMIC IN THE RURAL AND URBAN AREAS OF GHARBIA GOVERNORATE

6.3.1 The Rural Areas

From table (2) it's clear that there are statistically significant between the three categories of the total household income per month and the total sample in the rural areas before and during the widespread of corona pandemic, and through post hoc comparisons it was clear that the variations were in favor of the three categories of the total household income before the pandemic and the total sample in the rural areas that reached about 4086.6, 6749, 10526.6, 6452.0 L.E[1] respectively and with a standard deviation of 534.6, 819.7, 1088.7, 2750 respectively while the average of the three categories of the household income during the pandemic and the total sample in rural areas reached about 3142.3, 5803, 9356.1, 5449.6 L.E/month respectively, with a standard deviation of 798.7, 1037.4, 1942.8, 2830.9 respectively, whereas there was a decline in the household income in three categories and the total sample in the rural areas of about 944.3, 946, 1170.5, 1002.4 L.E respectively, Cohen value (d) also indicates the size of the effect that was caused by corona pandemic on the monthly household income of the three categories and the total sample in rural areas was large effect.

It was also clear that there were statistically significant between the average monthly household expenditure of the three income categories and the total sample in rural areas before the appearance of corona pandemic and during it's wide spread and on making post hoc comparisons it was clear that the differences were in favor of the household expenditure before the pandemic in the three income categories and the total sample in rural areas which reached about 4048.8, 5656.9, 7069.6, 5256.3 L.E and with a standard deviation of 1072.9, 838.1, 1314.2, 1654.6 respectively, while the average household expenditure of the three

[1] L.E: Egyptian pounds.

categories and the total sample of the rural areas during the pandemic reached about 3771.2, 5376.5, 6486.6, 4900.2 L.E respectively and with a standard deviation of 965, 552.3, 1141.8, 1468.6 respectively, whereas there was a decrease in the household expenditure of the three categories and the total sample of the rural areas during the pandemic that reached about 277.6, 280.4, 583, 356.1 L.E respectively, Cohen value (d) also indicates that the size of the effect that was caused by corona pandemic on the monthly household expenditure of the first, third category and the total sample in the rural areas of Gharbia Governorate was middle effect, while the size of the effect on the second category in the rural areas of Gharbia Governorate was a small effect.

Table 2. T-test results for the related samples and standard deviation between both the average household income and expenditure before and during corona pandemic in the rural areas of the research sample in Gharbia Governorate.

Income categories	Variables		Mean	Std. Deviation	Correlation	Mean differences	Std.Deviation of differences	T-test value	Cohen's (d)	Impact size assessment
The first	Income	Before	4086.6	534.6	0.535	944.33	683.4	(9.964)**	1.38	large
		During	3142.3	798.7						
	Spending	Before	4048.8	1072.9	0.871	277.62	527.8	(3.793)**	0.53	middle
		During	3771.2	965.0						
The second	Income	Before	6749.0	819.7	0.429	945.97	1009.4	(5.133)**	0.94	large
		During	5803.0	1037.4						
	Spending	Before	5656.9	838.1	0.504	280.40	735.7	(2.088)*	0.38	small
		During	5376.5	552.3						
The third	Income	Before	10526.6	1088.7	0.767	1170.54	1309.1	(4.732)**	0.89	large
		During	9356.1	1942.8						
	Spending	Before	7069.6	1314.2	0.716	583.00	939.4	(3.284)**	0.62	middle
		During	6486.6	1141.8						
Total	Income	Before	6452.0	2750.4	0.941	1002.35	961.2	(10.938)**	1.04	large
		During	5449.6	2830.9						
	Spending	Before	5256.3	1654.6	0.902	356.11	714.6	(5.226)**	0.50	middle
		During	4900.2	1468.6						

Source: The results of the research sample data in Gharbia Governorate for (2019/2020)(2020/2021).
(*) significant at: 0.05 level of significance, (**) significant at: 0.01 level of significance.

6.3.2 The Urban Areas

From table(3) it's clear that there are statistically significant between the average total household income per month before and during the pandemic in the three income categories and the total sample of the urban areas and on making post hoc comparisons it was clear that the differences were in favor of the household income of the three income categories and the total sample in the urban areas before the appearance of the pandemic as it reached about 3947.0, 6537.1, 10700.3, 5537.9 L.E respectively, with a standard deviation of 673.4, 1114.9, 1257.3, 2551.1 respectively.

Meanwhile the average income in the three categories and the total sample in urban areas during the pandemic reached about 3548.5, 5810.2, 9130.3, 4891.6 L.E respectively, with a standard deviation of 860.1, 1700.4, 1616.3, 2334.9 respectively, as the household income in the three income categories and the total sample of the urban areas during the widespread of corona pandemic was reduced by 398.5, 726.9, 1570, 646.2 L.E respectively, Cohen value (d) also indicates that the size of the effect caused by corona pandemic on the monthly household income of the first and second income categories and the total sample of the urban areas is middle effect, while the effect of the pandemic on the monthly household income in the urban areas in the third category is large effect, as the income decreased because of the decisions taken by the government to limit the spread of the disease such as: temporary closure in addition to the fact that some people stopped working.

From the same table it's clear that there are statistically significant between the average monthly household expenditure of the three income categories and the total sample in urban areas before the appearance of corona pandemic and during it's wide spread and on making post hoc comparisons it was clear that the differences were in favor of the household expenditure before the pandemic reached about 4017.5, 6165.1, 8592.3, 5186.9 L.E respectively, with a standard deviation of 883.2, 1449.3, 1284.9, 1994.6 respectively, while the average household expenditure in the three income categories and the total sample of the urban areas during the pandemic reached about 3814.0, 5415, 7770.2, 4765.5 L.E\month respectively, with a standard deviation of 936.9, 1373.2, 1663.2, 1832.8 respectively and the household expenditure of the three income categories and the total sample in the urban areas decreased reached about 203.4, 750.1, 822.1,

421.4 L.E respectively, Cohen value (d) also indicates that the size of the effect caused by corona pandemic on the monthly household expenditure of the first, second and third income categories as well as the total sample of the urban areas has been small, large, middle and middle respectively, which means that the monthly household expenditure of the urban areas sample was affected with the corona pandemic.

Table 3. T-test result of the related samples and the standard deviation between both the average household expenditure and income before and during the pandemic in the urban areas of the research sample in Gharbia Governorate.

Income categories	Variables		Mean	Std. Deviation	Correlation	Mean differences	Std.Deviation of differences	T-test value	Cohen's (d)	Impact size assessment
the first	Income	Before	3947.0	673.4	0.653	398.53	661.16	(7.859)**	0.60	Middle
		During	3548.5	860.1						
	Spending	Before	4017.5	883.2	0.828	203.44	535.85	(4.950)**	0.38	Small
		During	3814.0	936.9						
The second	Income	Before	6537.1	1114.9	0.704	726.89	1209.93	(4.806)**	0.60	Middle
		During	5810.2	1700.4						
	Spending	Before	6165.1	1449.3	0.851	750.06	774.37	(7.749)**	0.97	Large
		During	5415.0	1373.2						
the third	Income	Before	10700.3	1257.3	0.345	1570.00	1671.17	(5.942)**	0.94	Large
		During	9130.3	1616.3						
	Spending	Before	8592.3	1284.9	0.700	822.05	1193.13	(4.358)**	0.69	Middle
		During	7770.2	1663.2						
Total	Income	Before	5537.9	2551.1	0.906	646.24	1082.67	(9.880)**	0.60	Middle
		During	4891.6	2334.9						
	Spending	Before	5186.9	1994.6	0.922	421.42	773.25	(9.021)**	0.54	Middle
		During	4765.5	1832.8						

Source: The results of the research sample data in Gharbia Governorate for (2019/2020)(2020/2021).
(*) significant at: 0.05 level of significance, (**) significant at: 0.01 level of significance.

6.3.3 The Strength of The Statistical Tests and The Impact of Corona Pandemic on The Average Household Income in Both The Rural and Urban Areas of Gharbia Governorate.

From the data of table(4) it's clear that Independent Samples T-test, as the average household income per month in the urban areas before the pandemic reached about 5537.8 L.E, with a standard deviation of 2551.1, which is less than the average household income in the rural areas of Gharbia Governorate which reached about 6451.9 L.E, with a standard deviation of 2750.4, it's also clear that there are statistically significant between the average household income in the urban areas and the average household income in the rural areas in Gharbia Governorate before corona pandemic, which are in favor of the rural areas that have the highest averages moreover, the value of(η^2) also indicates that the size of the effect between the average monthly household expenditure in urban areas and the monthly household expenditure in rural areas in Gharbia Governorate before the pandemic is small,this difference return to area.

Meanwhile, the average household income in urban areas during the pandemic reached about 4891.6 L.E, with a standard deviation of 2334.9, which is less than the average household income in rural areas that reached about 5449.6 L.E, with a standard deviation of 2830.9, it's also clear that there are no statistically significant between the average household income in urban areas and the average household income in rural areas during the pandemic, the value of (η^2) also indicates that the size of the effect caused by corona pandemic was small and the lack of differences between the urban and rural areas may be due to the precautionary methods during the lockdown, the wide spread of the pandemic, the decrease of wages or the suspension of some jobs or economic activities and the psychological and economic pressures that followed it.

6.3.4 The Strength of The Statistical Tests and The Size of The Effect of Corona Pandemic on The Average Family Expenditure in The Rural and Urban Areas of Gharbia Governorate.

Table(4) shows the independent sample T- test as the average expenditure on food and non-food commodities from the family's monthly budget before the pandemic in urban areas reached about 5186.9 L.E, with a standard deviation of 1994.6, which is less than the average monthly household expenditure in the rural areas of Gharbia Governorate that reached about 5256.3 L.E, with a standard deviation of 1654.6,

It's also clear that there are no statistically significant between the average monthly household expenditure in urban areas and the monthly household expenditure in rural areas in Gharbia Governorate before the pandemic, which is in favor of the rural areas that has the highest averages, Moreover, the value of (η^2) indicates that the size of the effect between the average monthly household expenditure in urban areas and the monthly household expenditure in rural areas in Gharbia Governorate before the pandemic is small, this difference return to area.

Meanwhile, the average household expenditure per month in the urban areas during the pandemic reached about 4765.5 L.E, with a standard deviation of 1832.8, which is less than the average expenditure in rural areas that reached about 4900.2 L.E, with a standard deviation of 1468.6, it's also clear that there are no statistically significant between the average monthly household expenditure in urban areas and the average monthly household expenditure in rural areas in Gharbia Governorate during the pandemic and the value of (η^2) indicates that the effect caused by corona pandemic on the monthly household expenditure is a very small one and it's worth mentioning that the reason why the effect size is less than the minimum limit of the small effect size with the statistical significance is the sample size (the relation between the sample size and the effect size value is an inverse relation (Al-Sayyad, 1988)).

Table 4. Results of the T-test for independent samples of the difference between the average household income and monthly expenditure before and during the Corona pandemic according to the living area of the research sample in Gharbia Governorate.

Variables			N	Mean	Std. Deviation	T-test value	Eta square (η^2)	Evaluation
Monthly family income	Before the pandemic	Urban	274	5537.87	2551.1	(3.005)**	0.0230	Small
		Rural	110	6451.96	2750.4			
	During a pandemic	Urban	274	4891.62	2334.9	1.832 ns.	0.0087	Small
		Rural	110	5449.61	2830.9			
Monthly family spending	Before the pandemic	Urban	274	5186.95	1994.6	0.349 ns.	0.0003	Small
		Rural	110	5256.31	1654.6			
	During a pandemic	Urban	274	4765.52	1832.8	0.754 ns.	0.0015	Small
		Rural	**110**	**4900.20**	**1468.6**			

Source: The results of the research sample data in Gharbia Governorate for (2019/2020)(2020/2021).
(**) significant at: 0.01 level of significance, (ns.) Non-significant statistically.

6.4 The Factors Affecting The Monthly Household Expenditure in The Rural and Urban Areas of Gharbia Governorate Before and During Covid 19.

The economic theory indicates that the family household expenditure is affected by many factors such as: the decrease or the increase of the monthly income, the size of the family, the price of the necessary commodities, the price of the alternative commodities as well as the consumer tastes towards a certain commodity in addition to the urgent social and economic crises that happened in the society (the corona pandemic leading to the lockdown, and the precautionary methods) which affected the Egyptian household income and expenditure.

On estimating the double logarithmic multiple regression functions of the relation between monthly household income (x_1) and the number of the family members (x_2) (as independent variables) and the monthly household expenditure (y) (as a dependent variable) before and during the widespread of the pandemic in the rural and urban areas of Gharbia Governorate in the three income categories and the total sample, table(5) shows it was found that there is positive relationship and statistically significant for each of the total monthly family income and the number of family members and between the total monthly family expenditure before and during the outbreak of the pandemic in the three income categories and the total sample in the rural and urban areas of Gharbia Governorate.

6.4.1 The Rural Areas

Table(5) shows the confirmation of the common effect of both the total income per month and the size of the family on the total monthly household expenditure in the rural areas of Gharbia Governorate, as the assessed models before and during the pandemic was proven statistically significant, as their responsibility for the occurring changes in the total household expenditure per month concerning the consumption of food and non-food commodities, this is evidenced by the increase in the value of adjusted R-squared ($\bar{R}^2$) as it was about 52%, 17%, 29%, 67% respectively in the three income categories and the total sample before the pandemic, while it was 53%, 21%, 49% 76% respectively during the pandemic.

The expenditure flexibility coefficient in **the first income** category before and during the pandemic about 1.45, 0.68, which means that an increase of 10% in the total household income, when the family size is

constant is accompanied by an increase of about 14.5% in the consumption expenditure before the pandemic, while the increase during the pandemic about 6.8% and it was also clear that the family size flexibility coefficient in this category before and during the pandemic about 0.38, 0.18, which means that an increase of 10% in the family size when the monthly household income is constant is accompanied by an increase of about 3.8%, 1.8% respectively before and during the pandemic, Meanwhile in **the second income category** the expenditure flexibility coefficients before and during the pandemic are about 0.57, 0.29 respectively, which means that an increase of 10% in the total household income per month when the family size is constant is accompanied by an increase in the household expenditure of about 5.7% before the pandemic, while the increase during the pandemic reached about 2.9% and it was also clear that the family size flexibility coefficients in this category before and during the pandemic reached about 0.25, 0.12 respectively, which means that an increase of 10% in the family size when the monthly household income is constant is accompanied by an increase in the total family expenditure before and during the pandemic of about 2.5%, 1.2% respectively.

While the expenditure flexibility coefficients in the third income category before and during the pandemic were about 1.06, 0.65 respectively, which means that an increase of 10% in the total monthly household income when the family size is constant is accompanied with an increase of about 10.6% in the household expenditure, while the increase during the pandemic reached about 6.5% and it was also clear that the family size flexibility coefficient before and during the pandemic in this category reached about 0.06, 0.19, which means that an increase of 10% in the family size when the total household income is constant is accompanied by an increase of about 0.6%, 1.9% respectively in the total household expenditure per month.

Table 5. The Most important factors affecting family spending in the three income categories per month before and during the Corona pandemic in the rural of the research sample in Gharbia Governorate.

Income categories		No	Regression Equation	R^2	$\bar{R}^2$	F
First category (Income less than 5000 L.E)	before	1	$Logy_{1i}$= -1.90 + 1.45$logx_{1i}$ + 0.38$logx_{2i}$			
			(-2.454)*(6.708)**(2.638)**	0.539	0.521	28.684**
			$logx_{1i}$= 0.656 $logx_{2i}$=0.258		Beta	
	during	2	$Logy_{2i}$= 1.08 + 0.68$logx_{11i}$ + 0.18$logx_{2i}$			
			(3.295)** (6.943)** (1.258) ns.	0.543	0.525	29.163**
			$logx_{11i}$= 0.694 $logx_{2i}$=0.126		Beta	
The second category (income from 5000 - 9000 L.E)	before	3	$Logy_{1i}$= 1.39 + 0.57$logx_{1i}$ + 0.25$logx_{2i}$			
			(1.558) ns. (2.560)* (2.043)*	0.227	0.170	3.962*
			$logx_{1i}$= 0.467 $logx_{2i}$=0.373		Beta	
	during	4	$Logy_{2i}$= 2.54 + 0.29$logx_{11i}$ + 0.12$logx_{2i}$			
			(6.558)** (2.980)** (1.524) ns.	0.266	0.211	4.880*
			$logx_{11i}$= 0.502 $logx_{2i}$=0.257		Beta	
The third category (income greater than 9000 L.E)	before	5	$Logy_{1i}$= -0.47 + 1.06$logx_{1i}$ + 0.06$logx_{2i}$			
			(-0.365) ns. (3.472)** (0.294) ns.	0.342	0.289	6.493**
			$logx_{1i}$= 0.600 $logx_{2i}$=0.051		Beta	
	during	6	$Logy_{2i}$= 1.10 + 0.65$logx_{11i}$ + 0.19$logx_{2i}$			
			(2.050)* (5.221)** (1.274) ns.	0.523	0.485	13.689**
			$logx_{11i}$= 0.758 $logx_{2i}$=0.185		Beta	
Total rural sample	before	7	$Logy_{1i}$= 1.10 + 0.64$logx_{1i}$ + 0.28$logx_{2i}$			
			(6.453)**(14.018)** (3.077)**	0.688	0.682	117.752**
			$logx_{1i}$= 0.776 $logx_{2i}$=0.170		Beta	
	during	8	$Logy_{2i}$= 1.60 + 0.53$logx_{11i}$ + 0.19$logx_{2i}$			
			(14.465)**(17.463)** (2.471)*	0.769	0.765	178.284**
			$logx_{11i}$= 0.839 $logx_{2i}$=0.119		Beta	

Source: The results of the research sample data in Gharbia Governorate for (2019/2020)(2020/2021).

Whereas:

- $logY_{1i}$ = logarithm of the estimated value of total monthly household expenditure in L.E before the pandemic in the income category in observation i
- $logY_{2i}$ = logarithm of the estimated value of total monthly household expenditure in L.E during the pandemic in the income category in observation i
- Log = natural logarithm
- Observation in first category: 1, 2,….., 52
- Observation in the second category: 1, 2,….., 30
- Observation in the third category: 1, 2,….., 28
- Observation in total rural sample: 1, 2,….., 110
- $logX_{1i}$ = logarithm of the estimated value of the total monthly household income in L.E before the pandemic in the income category in observation i
- $logX_{11i}$ = logarithm of the estimated value of the total monthly household income in L.E during the pandemic in the income category in observation i
- $logX_{2i}$ = logarithm of the estimated value of household size in the income category in observation i
- (*) Significant at: 0.05 level of significance
- (**) Significant at: 0.01 level of significance.
- (ns.) Non-significant statistically.

The same table also shows that the expenditure flexibility coefficients in the total sample of the rural areas before and during the pandemic reached about 0.64, 0.53 respectively, which means that an increase of 10% in the total household income when the family size is constant is accompanied by an increase of about 6.4% in the household expenditure before the pandemic meanwhile, the increase during the pandemic reached about 5.3% and it was also clear that the family size flexibility coefficients in this category before and during the pandemic reached 0.28, 0.19 respectively, which means that an increase of 10% in the family size when the monthly household income is constant is accompanied by an increase of about 2.8%, 1.9% in the total household expenditure before and during the pandemic.

6.4.2 The Urban Areas

The table(6) shows the confirmation of the common effect of both the total monthly income and the size of the family on the total household expenditure in the urban areas of the governorate, as the assessed models before and during the pandemic was proven statistically significant, as their responsibility for the occurring changes in the total household expenditure per month concerning the consumption of food and non-food commodities, this is evidenced by the increase in the value of adjusted R-squared ($\bar{R}^2$) as it was about 56%, 25%, 15%, 79% respectively in the three categories and the total sample before the pandemic, while during the pandemic it was about 61%, 53%, 42%, 80% respectively.

The table also shows the expenditure flexibility coefficients and the family size flexibility from the expenditure functions that were assessed for the monthly household expenditure before and during the pandemic in the urban areas of the governorate in the three income categories and the total sample, as it was clear that the expenditure flexibility coefficients in the **first income category** before and during the pandemic have reached 0.89, 0.73 respectively, which means that an increase of 10% in the total household income per month, when the family size is constant is accompanied by an increase of about 8.9% in the household expenditure before the pandemic, while the increase during the pandemic about 7.3% moreover it was clear that the family size flexibility coefficients before and during the pandemic in this category reached 0.13, 0.08 respectively, which means that an increase of 10% in the size of the family, when the household income is constant is accompanied by an increase of about 1.3%. 0.8%respectively in the total monthly household expenditure before and during the pandemic.

While in the **second income category** the expenditure flexibility coefficients before and during the pandemic were 0.75, 0.64 respectively, which means that an increase of 10% in the total household income per month when the size of the family is constant is accompanied by an increase of 7.5% in the consumption expenditure before the pandemic, while the increase during the pandemic reached about 6.4% and it was also clear that the family size flexibility coefficients in this category before and during the pandemic are about 0.25, 0.18 respectively, which means that an increase of 10% in the size of the family, when the monthly household income is constant is accompanied by an increase in the total family expenditure before and during the pandemic of about 2.5%, 1.8% respectively.

Meanwhile, the expenditure flexibility coefficients in the **third income category** before and during the pandemic were about 0.56, 0.81 respectively, which means that an increase of 10% in the total household income per month, when the family size is constant is accompanied by an increase of about 5.6%, 8.1% respectively in the household consumption expenditure before and during the pandemic and it was found that the family size flexibility coefficients in this category before and during the pandemic reached 0.03, which means that an increase of 10% in the size of the family, when the household income per month is constant is accompanied by an increase of 0.3% in the total household expenditure before and during the pandemic.

From the same table it's also clear that the expenditure flexibility coefficients in the total sample of the urban areas before and during the pandemic reached about 0.79, 0.73 respectively, which means that an increase of 10% in the total household income, when the family size is constant is accompanied by an increase of about 7.9% in the household consumption expenditure before the pandemic, while the increase during the pandemic reached about 7.3% and it was found that the family size flexibility coefficients in this category reached about 0.14, 0.1 respectively before and during the pandemic, which means that an increase of 10% in the family size when the household income per month is constant is accompanied by an increase of about 1.4%, 1% respectively in the total household expenditure per month.

From the above the increase of household expenditure before corona pandemic is more evident than it was during the pandemic in the sample of the rural areas in the three categories and the total sample and the difference reached about 7.7%, 2.8%, 4.1%, 1.1% respectively, while in the sample of the urban areas it reached 1.6%, 1.1%, 0.6% respectively in the first, second categories and the total sample, while the monthly household expenditure in the third category during the pandemic increased by about 2.5% more than it before the pandemic, which shows that the higher income categories especially in the urban areas aren't affected with the consequences of corona pandemic.

Table (6). The most important factors affecting family spending in the three income categories per month before and during the Corona pandemic in urban research sample in Gharbia Governorate.

Income categories		No	Regression Equation	R^2	$\bar{R}^2$	F
First category (Income less than 5000 L.E)	before	1	$Logy_{1i} = 0.31 + 0.89\ logx_{1i} + 0.13\ logx_{2i}$ (1.370) ns. (13.840)** (2.645)**	0.562	0.557	107.25**
			$logx_{1i}$= 0.717 $logx_{2i}$=0.137	Beta		
	during	2	$Logy_{2i}$= 0.93 + 0.73 $logx_{11i}$ + 0.08 $logx_{2i}$ (5.776)**(16.140)** (1.517) ns.	0.616	0.612	134.190**
			$logx_{11i}$= 0.776 $logx_{2i}$=0.073	Beta		
The second category (income from 5000 - 9000 L.E)	before	3	$Logy_{1i}$= 0.75 + 0.75 $logx_{1i}$ + 0.25 $logx_{2i}$ (1.189) ns. (4.714)** (1.609) ns.	0.276	0.253	11.653**
			$logx_{1i}$= 0.517 $logx_{2i}$=0.177	Beta		
	during	4	$Logy_{2i}$= 1.23 + 0.64 $logx_{11i}$ + 0.18 $logx_{2i}$ (4.101)**(8.600)** (1.332) ns.	0.549	0.534	37.074**
			$logx_{11i}$= 0.744 $logx_{2i}$=0.115	Beta		
The third category (income greater than 9000 L.E)	before	5	$Logy_{1i}$= 1.66 + 0.56 $logx_{1i}$ + 0.03 $logx_{2i}$ (2.144)* (2.891)** (0.252) ns.	0.190	0.146	4.344*
			$logx_{1i}$= 0.430 $logx_{2i}$=0.037	Beta		
	during	6	$Logy_{2i}$= 0.64 + 0.81 $logx_{11i}$ + 0.03 $logx_{2i}$ (1.090) ns. (5.480)** (0.214) ns.	0.452	0.423	15.273**
			$logx_{11i}$= 0.670 $logx_{2i}$=0.026	Beta		
Total urban sample	before	7	$Logy_{1i}$= 0.68 + 0.79 $logx_{1i}$ + 0.14 $logx_{2i}$ (7.219)**(31.699)** (2.935)**	0.795	0.793	524.205**
			$logx_{1i}$= 0.878 $logx_{2i}$=0.081	Beta		
	during	8	$Logy_{2i}$= 0.94 + 0.73 $logx_{11i}$ + 0.10 $logx_{2i}$ (11.119)**(32.373)** (2.077)*	0.798	0.797	536.228**
			$logx_{11i}$= 0.887 $logx_{2i}$=0.057	Beta		

Source: The results of the research sample data in Gharbia Governorate for (2019/2020)(2020/2021).

Whereas:

- $logY_{1i}$ = logarithm of the estimated value of total monthly household expenditure in L.E before the pandemic in the income category in observation i
- $logY_{2i}$ = logarithm of the estimated value of total monthly household expenditure in L.E during the pandemic in the income category in observation i
- Log = natural logarithm
- Observation in first category: 1, 2,….., 170
- Observation in the second category: 1, 2,….., 64
- Observation in the third category: 1, 2,….., 40
- Observation in total urban sample: 1, 2,….., 274
- $logX_{1i}$ = logarithm of the estimated value of the total monthly household income in L.E before the pandemic in the income category in observation i
- $logX_{11i}$ = logarithm of the estimated value of the total monthly household income in L.E during the pandemic in the income category in observation i
- $logX_{2i}$ = logarithm of the estimated value of household size in the income category in observation i
- (*) Significant at: 0.05 level of significance.
- (**) Significant at: 0.01 level of significance.
- (ns.) Non-significant statistically.

7. CONCLUSION OF DISCUSSION

The Paired Samples T-tests it has been found that there are statistically significant between the average total household income per month in the three categories and the total sample in the rural areas before and during the widespread of corona pandemic, also that there are statistically significant between the average total household expenditure per month before and during the widespread of corona pandemic, and from the results of the research the decrease in the household income in the three categories and the total sample of the urban areas during the pandemic at about 944.3, 946, 1170.5, 1002.4 L.E, while the household expenditure decreased at about 277.6, 280.4, 583, 356.1 L.E during the pandemic.

As for the sample of the urban areas it has been found that there are statistically significant between the average total household income per month in the three categories and the total sample in the urban areas before and during the widespread of corona pandemic, also that there are statistically significant between the average total household expenditure per month before and during the widespread of corona pandemic, and from the results of the research the decrease in the household income in the three categories and the total sample of the urban areas during the pandemic about 398.5, 726.9, 1570, 646.2 L.E while the household expenditure decreased about 203.4, 750.1, 822.1, 421.4 L.E during the pandemic.

The value of Cohen (d) indicates that the size of the effect caused by corona pandemic on the three categories of the household income per month and the total sample of the rural areas was large, while the size of the effect on the sample of the urban areas was middle regarding the monthly income in the first and second income categories and the total sample of the urban areas and it was large in the third category of

the urban areas, while the size of the effect of corona pandemic on the monthly household expenditure in the first, third categories and the total sample of the rural areas was middle and the effect in the second category was a small, while it was the size effect of the pandemic on the monthly household expenditure in the sample of the urban was small, large, middle and middle respectively in the three categories and the total sample of the urban.

An Independent Samples T-test was also done whereas it was found that there are statistically significant between the average household income per month in the urban and rural before the corona pandemic and it was also found that there are no statistically significant between the two averages during the pandemic, moreover there are no statistically significant between the average monthly household expenditure in urban and the average monthly household expenditure in rural before the pandemic, and there are no variations between the two averages in Gharbia governorate during the pandemic, and the value of (η^2) indicates that the size of the effect of corona pandemic on both the household income and expenditure per month in the urban and rural areas is small and the fact that there are no differences between the urban and rural areas may be due to the precautionary methods caused by the pandemic during the lock down, the widespread of the pandemic, the decrease in wages or the suspension of some jobs and economic activities.

By studying the most important factors affecting the monthly household expenditure in the research sample in the rural and urban areas it was found that there is positive relationship statistically significant between each of the total household income and the number of family members and between the total household expenditure before and during the widespread of the pandemic in the three income categories and the total sample of rural and urban areas, and the results showed that the monthly household expenditure before the widespread of the pandemic was more than that during the widespread of the pandemic in the three categories and the total sample and the difference reached about 7.7%, 2.8%, 4.1%, 1.1% respectively, as for the urban sample, the increase in the first and second categories, and the total urban sample reached about 1.6%, 1.1%, 0.6%, while the monthly family spending during the pandemic increased than before the pandemic in the third category by about 2.5%, which shows that the higher income categories especially in the urban areas weren't affected with the consequences of corona pandemic.

By evaluating the effect of corona pandemic it's clear that the number of families whose income decreased during the pandemic in the sample of the rural and urban areas in Gharbia governorate is about 85, 149 families, and the categories that are harmed the most by the pandemic are those who work in professions with unconstant payment and they represent 60.9% of the total number of families in the sample which reached 384 families, and some of the most important reasons that lead to the decrease of the household income are: the cessation of work of one of the family members, in addition to imposing the precautionary measures, the stoppage of work of some of the family members, the decrease of the demand on the activity, low wages, decreasing work days and hours and irregular work, while some families dealt with this decrease through some necessary measures such as: dispensing with some quantities of unnecessary commodities when their price rises, and also some families relied in their consumption on what can be planted or raised at home or receiving a benefit from the Egyptian government during the stoppage of work which represents about 74.4%, 55.7%, 3.1% respectively of the total research sample.

8. RECOMMENDATIONS

- Despite the financial assistance provided by the Egyptian government to members of society, which amounted to 500 L.E per person for a period of three months, especially for those who work in the informal sectors (unfixed salaries), but there are those who did not receive such financial aid.
- The need for the state to take some measures that would prevent the exploitation of the citizen by providing protection to the consumer from the greed of traders for food commodities, disinfectants and masks whose price has increased in an exaggerated manner, which made some citizens, refrain from wearing them.
- The necessity for the Ministry of Education to put an end to the private tutoring centers and the exploiters of school students by raising the prices of lessons, especially after the closure of schools, which exhausted the family's income on education.
- The necessity of strengthening health care systems to control the spread of the Corona pandemic and other emerging epidemics in the future.
- The society should change its consumption pattern in proportion to the income, pay attention to healthy eating and strengthen the immune system.

REFERENCES

1. Behache, Abdelheq. (2019). The importance of practical significance styles in regulating results and conclusions of psychological and educational research. Arab Journal of Psychology. 1(4), 248-259.
2. Cohen, J. (1977). Statistical power analysis for the behavioral sciences (rev. ed.). New York: Academic Press.
3. Cohen, J. (1988). Statistical power analysis for the behavioral sciences. Hillsdale, NJ: Erlbaum.
4. Enaam Shuaibi. (2018). Crisis Management and its Role in the pace of Consumer Behavior of the Family. International Journal of Human and Social Sciences. College of Humanities and Social Sciences. Issue (6), 124-151. http://search.mandumah.com/Record/1099394
5. Fagley, N. & Mckinney, I. J. (1983). Reviewer bias for statistical significance results: reexamination. Journal of Counseling Psychology, 30(2), 298-300.
6. Gharbia Governorate. (2019). Information Center. unpublished data, Egypt.
7. Huston, L.(1993). Meaningfulness, statistical general significance, effect size, and power analysis: a general discussion with implications for manova. Paper presented at annual meeting of the mid-south educational research association (2nd, New Orleans, LA, November 9-12, 1993).
8. The Information, Support and Decision–Making center of the Egyptian Cabinet. A report on Covid-19 Statistics in Egypt and the World. Egypt, December 31, 2021. http://www.care.gov.eg
9. Mohamed, E. (2011). Psychological and Educational Statistics (applications using SPSS18). Egypt: Arab Thought House.
10. Al-Sayyad, A. (1988), the practical significance and sample size accompanying the statistical significance of the (t) test in educational. Psychological and Arab research, a working paper presented at the Educational Broadcasting Conference. Reality and the Future. Volume Two. National Center for Educational Research. Egypt.
11. Steven K. Thompson, 2012, Sampling, Third Edition, P:59-60.
12. Xitao, F. (2001). Statistical significance and effect size in education research: Two sides of a coin. Journal of Educational Research, 94 (5), 275-283.