Consumer Buying Behavior During the Epidemics Spread: Through Application on COVID-19 Pandemic

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Abstract

This scientific paper clarifies the most important changes that occurred to the theoretical model of individual behavior when deciding to get vaccinated and to select one of the vaccines offered to him/her during the pandemic period and discusses the ratio of his/her spending on cleaning tools and disinfectants. The study concludes that the mortality ratio to the infection cases follows a seasonal trend that increases in the months of (March – April – May). The educated and most cultured heads of families holding (University Degree – Master's – PhD) have represented the higher percentage in following the precautionary measures through buying and using disinfectants during the coronavirus pandemic period. There is also interest and keenness to get vaccinated among the high-income groups, and there is no effect of demographic variables under the study on the individuals and their dependents' infection or the time of infection (before – after) the individual access to vaccination.

Keywords: consumer's decision making, vaccination, marketing mix, COVID19, sesonality, demographic variable

1. Introduction

The Coronavirus pandemic that swept the world as a result of the COVID-19 spread is one of the most important crises that changed the patterns of buying many essential goods (food and non-food items), as it has reclassified some goods from non-essential to essential and from private goods to shopping goods, for example, means of protection such as (gloves/masks) and disinfection tools (such as alcohol/detergents) and others, as the consumption rates thereof have increased unprecedentedly during the pandemic period (The Egyptian Cabinet's Information and Decision Support Center (IDSC), 2022). The spread of the virus led to a state of fear, anxiety and tension among individuals, affecting the general psychological state, which was described by the physicians as a general state of depression that afflicted individuals as a result of the spread of information on the severity of the virus and the rise in infection and mortality rates that swept the world, also as a finding of the precautionary measures applied by countries such as isolation, social distancing, directing citizens to wear masks and use means of disinfection and protection, etc. All these policies were reflected consequently on the psychological state of the consumer and his/her buying decisions, which varied from one person to another according to personal characteristics and the extent of financial stability (Yuen et al., 2021). Previous scientific studies have indicated that the state of tension that affects the consumer is one of the most important factors, which have an effect on his/her behavior and decisions during crises and extraordinary environmental circumstances (Hensel et al., 2012).

By applying the study to the coronavirus pandemic, the consumer responded to buying behavior that mitigates the states of fear, anxiety, stress and depression that afflicted him/her, as some individuals overbought some goods that were classified during the pandemic as essential goods (such as food, water, health products, medicines, personal protection means, and disinfectants, etc.) to gain a sense of safety and comfort, and others overused games and overbought various entertainment means (Bentall et al., 2021). In the attempt by individuals to take measures to overcome that crisis, one of the most important means of protection against this virus was the decision taken by individuals to get vaccinated. Although the epidemic was global, we find that the stages of the individual's behavior varied from one country to another, and also from one individual to another inside the

same country during the pandemic period. This scientific paper clarifies the most important changes that occurred to the theoretical model of individual behavior when deciding to get vaccinated and to select one of the vaccines offered to him/her during the pandemic period and discusses the ratio of his/her spending on cleaning tools and disinfectants during the spread of the (COVID-19) pandemic, and the impact thereof on the elements of the marketing mix, which will be reflected accordingly on the marketing strategies of business organizations.

2. Previous Studies

The study by (Narcum et al., 2020) provided an analysis of the most important changes that occurred in the buying behavior adopted by American consumers during the pandemic period, which confirmed that their behavior and decisions towards some products have changed, as the purchase of non-essential consumer goods was decreased in general, and the rates of virtual shopping and online purchasing increased, and the study confirmed that the lockdown and physical distancing associated with the (COVID-19) crisis have affected consumers' perception and buying habits, and their reliance on indirect shopping using the Internet to reduce the likelihood of infection with the virus, and the independence of their shopping decisions has been decreased (Sheth, 2020).

The study by (Narcum et al., 2020) also found that since the declaration of the COVID-19 pandemic, 76% of consumers in the study sample have shopped online from websites and stores that they have not thought about before, and the study gave an example of Walmart International Retail Company, which helped its customers to complete purchases and obtain their goods without entering the stores, as it intensified its investments in the field of e-commerce, which prompted a significant increase in its profits during the second quarter of 2020 (Perez, 2020).

Ali (2020) also confirmed that the rates of buying food online have tripled since the beginning of the pandemic and marketers have tended to deliver products to homes and consumers are looking directly for the products offered online. Consumers who see themselves at risk of infection (COVID-19) or have doubts about it have tended to follow precautionary shopping behaviors remotely (Cranfield, 2020).

As a finding of fear and anxiety, a lot of people rushed to store the essential goods, where (Akhtar, et al., 2020) say that the buying process is just a reaction to the course of events resulting from coronavirus spread and because the governments promoted the social distancing policies. Several consumers resorted to stockpiling huge storage of the goods as preparation for the movement restrictions that may cause disruptions and interruptions of logistic supplies in all food distribution and supply systems. The retailers also responded to the temporary rationalization approach, where some restrictions were applied to buying the essential goods, such as the period of grocery shopping for the elderly and the people who suffer from chronic diseases and are exposed to danger, as they become aware of the digital transactions and remotely buying, so some of them enjoyed buying when used advanced technologies not attended by them before, and as the health fears were increased, the demand to the indirect distribution channels was increased (Pantano et al., 2020).

Some consumers also continued to buy and store goods as a matter of convenience and to ensure availability thereof, and to reduce the number of times to go shopping to protect them from the risk of infection with the virus (Clemens et al., 2020), and as a result of the application of social distancing measures, the state of fear and depression increased among individuals, and the policy of lockdown and curfew caused economic crises for many companies, as they had to dismiss many workers, which led to an increase in unemployment rates, consequently affecting public spending rates (Brooks, 2020).

The study by Kucera and Rydell (2021) confirmed that there is a change in buying and shopping behaviors in Italy and the EU countries after the governments of those countries declared some regulations and precautionary measures, as the pandemic reshaped the food behaviors of individuals and their way of shopping in accordance with the applicable regulations and procedures.

A study by Dabija et al. (2021) confirmed in its conclusion that one of the most important effects of the COVID-19 pandemic is that it shaped the consumer's eating behavior differently from the previous behaviors adopted pre-coronavirus.

The study by Rajagopal (2020) called on researchers and marketers to understand the psychological factors that are driving consumer behavior as a crucial element that enables us to understand those unprecedented changes in the buyer behavior during the COVID-19 pandemic period, which turned the category of some products from non-essential to essential ones and vice versa.

At the onset of the COVID-19 pandemic, the study by Diebner et al. (2020) recommended the necessity to raise the levels of knowledge of the makers of marketing policies on the most important psychological factors that

affected the behavior of the consumer and changed buying decisions of the buyers to avoid any negative repercussions that occur in the future, affecting the volume of sales and profits.

In the previous literature and studies, a study by Arndt et al. (2004) confirmed (at that time) that external events surrounding the individual and threatening his safety stimulate a "compensatory response", where spending and buying rates increase as an attempt to alleviate fear and anxiety, to gain a sense of safety and comfort and to escape from the depression that may affect him, as the study considered that the buying and spending process is a compensatory mechanism to alleviate the state of tension, and since the buying motive may represent an attempt to regulate negative feelings, the actual need for the products purchased may sometimes be irrelevant and unnecessary for the individual (Kennett et al., 2012).

Some literature has also suggested that stress can lead to an "active response" to an individual's buying behavior, increasing spending rates and "impulsive buying" (stress caused by the event may also lead to a "depressive mood" in some cases, and may reflect and develop into "dysfunctional" or "impulsive" behavior, which is known as "sudden desire to buy something associated with an excessive emotional response") (Burroughs et al., 2005).

The study by Duhachek et al. (2005) and Sneath et al. (2009) confirmed that changes in buying rates during the spread of fear and anxiety are often interpreted as a "self-protection" strategy that aims to protect the individual himself from depression and manage negative emotions to regain positive emotion.

In contrast, the study by Henry et al. (2011) emphasized that stress is an important factor in negatively affecting consumer behavior. Individuals may withdraw from the buying process, and not decide to buy, adopting a negative attitude as a result of stress, so their buying rates decrease.

As for the study by Jeżewska et al. (2020), it confirmed the need to classify products during crises or sudden events as essential and non-essential to better understand consumer behavior. The researchers also stressed that consumers may tend to be more willing to spend on the essential products (versus non-essential ones) according to the nature of each crisis, in exchange for the availability of daily products necessary for their survival, with the possibility of that some people may tend to buy quantities of food more than usual, increasing with higher levels of tension, given that they follow the strategy of "self-justification" when buying non-essential products as a means of pleasure and entertainment and a way to reduce boredom.

The study by Aquino et al. (2020) confirmed the existence of a positive relationship between income and levels of per capita expenditure during crises or sudden events, as buying essential products (for shopping to meet the basic needs) increases, as well as the "impulsive buying" of non-essential products (shopping for enjoyment) increases as an attempt to get rid of or reduce pain and tension.

The study by Lins et al. (2020) confirmed the existence of a positive relationship between "impulsive buying" and the state of panic that afflicted individuals during the outbreak of coronavirus, as the researchers described the buying behavior of consumers as a hasty behavior that lacks the careful consideration of information and alternatives available to the consumer, and that this situation has afflicted many consumers as a result of their fear of the infections and their poor psychological state.

The study by Di Crosta et al. (2021) also linked the anxiety, fear and depression that prevailed during the pandemic period and the consumer's buying behavior towards essential and non-essential products through some variables such as the individual's characteristics, financial stability and subjective justifications for the buying process, as it examined and analyzed whether there has been a change in the levels of spending of individuals during the first peak of infection? Has it been associated with changes in consumer categorization and buying of essential and non-essential products? This study concluded that the COVID-19 pandemic had a significant impact on consumer behavior, as spending levels increased, but buying both essential and non-essential products at the time raised the anxiety and panic states resulting from the poor psychological state that afflicted individuals.

A study by Bentall et al. (2021) also confirmed the raise in the consumers buying rates for some goods that the study classified as essential (such as food, water, health products, and medicines), as researchers analyzed it based on that the high levels of tension induces consumers, in general, to save money and increase spending rates, but only on products that are considered essential during the pandemic. Nielsen (2020) and the study by Cannito et al. (2021) confirmed that the increase in sales is related to essential products in particular, as the consumer spent on products that meet his/her basic needs, such as food, hygiene products, personal protection means, etc.

In this context, and referring to the circumstances and events that occurred during the pandemic, a study by

Esposti et al. (2021) indicated that there has been a change in the patterns of buying some shopping goods such as clothing, which decreased compared to some recreational products that sales thereof were increased. The study by Mitchell (2020) found a significant decrease in consumer spending on durable goods in the USA.

A study by Chirumbolo et al. (2021) did not ignore the impact of job Insecurity and uncertainty of survival, and its negative effect on consumer spending rates and buying decisions.

Analysis of the different psychological factors implied in consumers' behavior and changes to their buying decisions remains an area rarely understood and interpreted. In the case of (uncertain) threats, "mental behavior" usually becomes more dominant, prompting individuals to engage in behaviors that are interpreted as acts necessary for survival during those crises. Sometimes the rate of spending on recreational goods increases to help in getting rid of depression and tension (Dodgson et al., 2020).

In all cases, it is necessary to study what happened during the COVID-19 pandemic to learn therefrom when developing contemporary marketing policies and strategies facing crises or epidemics that may occur, which may negatively affect the sales rates and profitability of business organizations (Song et al., 2020).

As a study by Root (2020) predicted that policies calling for social distancing and wearing a face mask will hinder the ability of marketers to provide customers with satisfactory services, and thus this will be reflected on their buying decisions and their levels of satisfaction with the marketing services provided to them, therefore, the study expected large losses incurred by companies, impacting negatively on the economies of all countries in the near future.

As for the stages of the consumer's buying decision making process, we find that it consists of five basic stages, the first of which is identifying the problem (when the consumer recognizes his need for the product), then the second one is his behavior in searching for information about the product that will meet his desire and satisfy his need; then evaluating the alternative products; the decision to get vaccinated; and finally, the post-purchase evaluation, which refers to the state of satisfaction or dissatisfaction with the product (Nicosia, 1982).

2.1 Theoretical Framework

In this scientific paper, the stages of the consumer's decision to get vaccinated and choose one of the vaccines offered as one of the means of protection from COVID-19 will be applied, as the individual's decision to get vaccinated has gone through the following stages.

First Stage: The Emergence and Spread of the Virus: Since governments announced the discovery of infection cases on their lands and began to apply precautionary measures relied on policies of social distancing and the lockdown of shops and parks, many services stopped and some were provided remotely, such as education and health, and the rates of individuals' use of gyms, cafes, shopping malls, transportation, tourism, etc. decreased, and the consumer began to know more about the virus, the reasons for its emergence and the extent of its danger, and the world witnessed a state of fear, anxiety and depression, and the desire to prevent this disease and its consequences, and the consumer tended to buy health and personal hygiene products to be protected from the virus (Ruggless, 2020).

Second Stage: Search for Information: Consumers gathered information related to the virus and the ways that shall be adopted to be protected from it. They also followed the numbers of mortalities and infections and the news of the artists, politicians and celebrities who were infected, and were wondering about possible methods of protection. Developed countries rushed to discover and manufacture vaccines to prevent the risk of infection with this virus, amid an increased fear from community participation, physical contact or presence in retail stores, supermarkets, shopping malls, public transportation and… etc. …. Moreover, they followed many news sources such as the World Health Organization as well as local sources to identify the extent of the disease spread and follow up on the types of available vaccination and recognize the country of origin of each vaccine.

Third Stage: Evaluation of Alternatives: The consumer analyzed the information collected from the sources of the primary and secondary groups surrounding him and began to evaluate the types of vaccines provided by each country according to their capabilities and resources, so he began to recognize the vaccination doses of each vaccine and to choose from among the available vaccines, while at the same time he began to raise questions about the adverse effects of vaccination and the extent of the expected risks that may affect him in the future. Finally, the appropriate vaccine was chosen according to the perspective of each consumer, experience, perception and personal belief.

Fourth Stage: Buying Behavior: The consumer became ready to make his decision to choose the right vaccine, as consumers tried to reduce the perceived risks by seeking government support and also the social support from friends, family and specialized experts to determine the benefits of getting vaccinated or not, and in light of the

uncertainty and despite the emergence of rumors linked to the interests of the companies that produce vaccines and under pressure from the governments of countries, the consumer chose to restore stability and safety to his life and resort to vaccination, despite the spread of rumors or (facts) that the disease was created by governments that have political interests with other countries, but many took their decision to get vaccinated and get rid of the state of public depression that afflicted them due to their continued isolation and fear of communicating with the outside community.

Fifth Stage: Post-Purchase Operations: After vaccination, some individuals were infected with the virus and entered the isolation hospital, which made some of them dissatisfied with the decision of getting vaccinated and regretted spending a part of their income on personal protection means, and some of them did not get vaccinate and did not spend any money on protection means, but they were not infected!!

This study followed the stages of buying behavior by applying to the case of vaccination against the novel coronavirus in the Arab Republic of Egypt. The first stage is focused on compiling the volume of mortalities and infections during the previous two years from March 2020 to February 2022, and accordingly, a model that measures the rates of mortality to infection was prepared. The second stage was represented in the fifth part of the questionnaire, the third was represented in the fourth part of the study, the fourth stage was represented in the second and third parts, and the last stage was represented in the last (sixth) part of the form.

If we look closely, we will find that the effects of the coronavirus pandemic have been reflected in the elements of the marketing mix as follows:

- **Product:** Attention to the safety and quality of products—the lifecycle of some products may vary according to the epidemics, crises, the ways of treatment thereof or prevention therefrom—the focus will be directed to packaging and wrapping- warranty and maintenance—the diversity of many similar shopping goods may decrease—the demand for product identification and determination of the country of origin clearly for the consumer will increase.

- **Pricing:** electronic payments, using bank credit cards, and public and private sectors instant payment applications will increase—forward pricing policies will vary—promotional pricing and securities will disappear and will be replaced by Block Chain—and virtual currencies.

- **Distribution:** The focus will be directed to shipping companies—displaying products through the company's website—limiting the role of intermediaries—and the use of mobile applications will increase—to increase the customer's confidence and safety.

- **Promotion:** Utilization of displays and posters (Outdoor) will decrease and the means of print publishing will disappear—use of 3D photography of products will increase using augmented and virtual reality on the company's website and social media, and the importance of reviewers—comments and social media influencers will increase and advertising will increase in virtual reality and metaverse environments - and prizes, gifts and discounts will spread therein and the customer will live an experiment that simulates the truth.

3. Methodology

3.1 Study Aims

- To determine the elements and components of the marketing mix and the stages of the buying decision in light of the spread of epidemics by applying to the individual's decision to get vaccinated during the Covid-19 pandemic.

- To study the phenomenon of the spread of Covid-19 in the future represented in rates of death to the infection without exaggeration about monitoring thereof.

- To study the stages of the crisis and know the demographic characteristics that distinguish each stage separately.

- To identify the most important timing of the virus outbreak throughout the year.

3.2 Study Problem

The official reports issued by the Egyptian Ministry of Health and Population (February 2022), at the time of preparing this study (March 2022), announced that the number of people who get the first dose of the coronavirus (COVID-19) vaccine reached 37,425,628 persons, and the number of people who received the second dose reached 4,605.263 persons, while 622,204 persons have gotten vaccinated with the (third) booster dose. Accordingly, the following questions have arisen.

- Did anyone who did not spend their income on personal protection means, did not follow the precautionary measures, did not adhere to the social distancing, or did not receive vaccination doses get infected?

- What is the explanation that some people allocated a part of their income to be spent on purchasing personal protection tools and means (such as alcohol-masks, etc.) and received the prescribed vaccination doses, but they got infected with the virus and some of them entered isolation hospitals?

- Will this phenomenon be vanished or will the numbers increase in the coming period?

- What are the differences that appeared in the elements of the marketing mix 4, Ps, consumer decisions and his buying behavior post coronavirus pandemic?

As a result of the COVID-19 pandemic, there has been a change in the behavior of the individual appeared in his buying decision for goods and services as well as when he made his decision to get vaccinated against the novel coronavirus, especially after the spread of infections with the virus even after receiving the vaccination (either one or more doses).

Its effects were also clearly reflected in the elements of the marketing mix that were affected by pre- and post-precautionary measures, as the product display means, payment and communication methods have been changed. This epidemiological situation was also reflected in the marketing strategies followed and marketing policies that must be considered when any epidemic or outbreak of any other phenomenon occurs (God forbid). Marketers have faced great marketing challenges, especially as the virus continues to mutate at a high speed and in light of the associated global economic crisis. The following figure (Figure 1) presents the dimensions of the problem and the questions of the study.
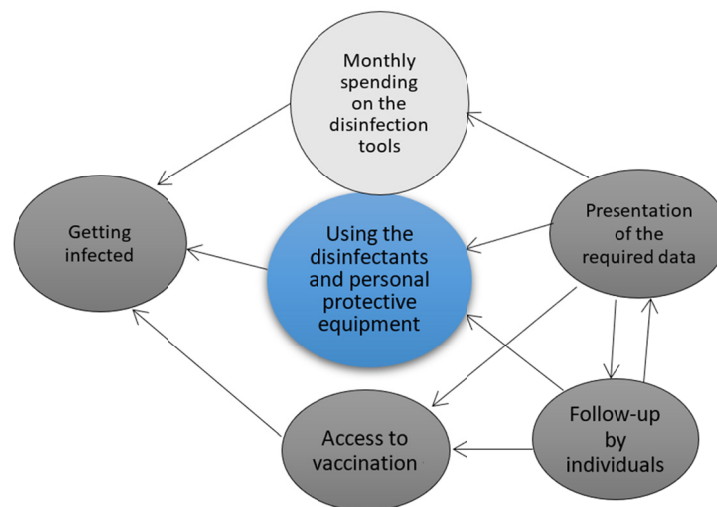
Figure 1. Dimension of the research problem

3.3 Study Population

Head of the family and who is responsible for it (Male-female). The researcher was keen that the respondent shall fulfil some conditions; including being a worker and getting into contact with individuals, whether they are public audience or co-workers, being aware of technology and can use the Internet, as well as the ability to search for news and follow up on current events.

1) Study Sample

The questionnaire was prepared and presented on the Internet to communicate with the respondents and give them the mobile number on which the WhatsApp application is downloaded in order to communicate with the respondents and overcome the difficulties that they may face in completing and answering the questionnaire questions. Due to the novelty of the phenomenon at that time and where there were many people interested therein, the questionnaire was presented and completed within a week, as about (220) forms were collected and after revision, about (20) forms were excluded because there was a high degree of bias in the responses or the failure to complete the form, so the correct response rate was 90.9%. The following is a presentation of the

demographic characteristics of the research sample:

Table 1. Frequency and relative distribution of some research sample demographic vriables

Some demographic variables	Frequency	%
1. Gender:		
- Male	96	48.00
- Female	104	52.00
2. Nature of Work (Job)		
- Not Dealing with the Public	89	44.5
- Dealing with Public	111	55.5
3. Dependency		
- I support dependents	51	25.5
- I do not support dependents	149	74.5
4. Education Level:		
- Intermediate Education	12	6.00
- University Education	140	70.00
- Master's	30	15.00
- Doctorate	18	9.00
5. Income Level (EGP)		
Less than 2000	24	12.0
2000–	33	16.5
4000–	36	18.0
6000–	23	11.5
8000–	7	3.5
10000–	31	15.5
15000–	18	9.0
20000–	13	6.5
30000–	15	7.5

This analysis aimed to reclassify the items into independent groups and to recognize the factors extracted after Orthogonal Rotation 'Varimax'.

Table 2a. Findings of loading coefficients for the three factors using orthogonal rotation

Serial Number	Statements	Factor No. (1)	Factor No. (2)	Factor No. (3)
1	I buy disinfectants to be used at home constantly.			0.891
2	I use disinfectants to clean the house frequently.			0.827
3	I buy personal masks constantly.		0.792	
4	I wear personal masks constantly.		0.719	
5	Expenditure on personal protection tools and means has increased -		0.738	
6	I buy masks for my children to wear it.		0.653	
7	My children wear masks all the time.	0.734		
8	I strictly follow precautionary measures.	0.713		
9	My children follow the precautionary measures carefully.	0.906		
10	My wife/husband follows the precautionary measures carefully.	0.761		

The following table illustrates the names of the three factors as well as the explanatory and cumulative ratios for each factor.

Table 2b. Findings of naming the three factors and measures of relative importance

Factor	Name of Factor	Latent root	Explanatory ratio-	Cumulative ratio-
First	Buying and using disinfectants during the COVID-19 pandemic.	3.022	30.221	30.221
Second	Buying and wearing masks by the head of the family and his family during the COVID-19 pandemic.	2.584	25.843	56.064
Third	Following the precautionary measures by the head of the family and his family.	1.982	19.817	75.881

The findings illustrated in the two previous tables confirmed that the most important factors that achieve the highest degree of explanation were as follows:

- Buying and using disinfectants during the coronavirus pandemic. Its explanatory ratio reached 30.22%, followed by:

- Buying and wearing masks by the head of the family and his family during the pandemic. Its explanatory ratio reached 25.843%, followed by:

- Following the precautionary measures by the head of the family and his family. The explanatory ratio reached 19.817%.

- The total explanatory ratio reached 75.881%.

Table 3. Findings of descriptive statistics and relative importance of following up the numbers of infected persons, mortalities, and recovering persons

Statements	Descriptive statistics of the Research			Ranking and Relative Importance -
	Weighted Arithmetic Mean	Standard Deviation	Coefficient of Variation (%)	
1. I had followed with interest the daily numbers of infections	3.290	1.073	32.619	1
2. I had followed with interest the daily numbers of mortalities	3.165	1.142	36.084	2
3. I had followed with interest the daily numbers of recovering persons	3.085	1.031	33.421	3
4. I had followed with interest the cases of the celebrities who have tested positive for the coronavirus	2.785	1.215	43.626	5
5. I had followed with interest the cases of the celebrities who have recovered from coronavirus	2.775	1.192	42.964	6
6. I had followed with interest the cases of the celebrities who died due to coronavirus infection	2.820	1.197	42.476	4

4. Results

4.1 Validity Test for the First Hypothesis of the Study

To test the validity of the first hypothesis, which states that "there is no clear trend in the mortalities due to infection with COVID-19, the researcher used Classical Time Series Analysis. To find out the future trends of mortality to infection ratio during the pandemic, which started in Egypt in March 2020 till the end of February 2022 (until the period of this study preparation). The findings of the first hypothesis are presented below.

- Time series plot during the study period

The following figure (Figure 2) shows the series data during the study period.
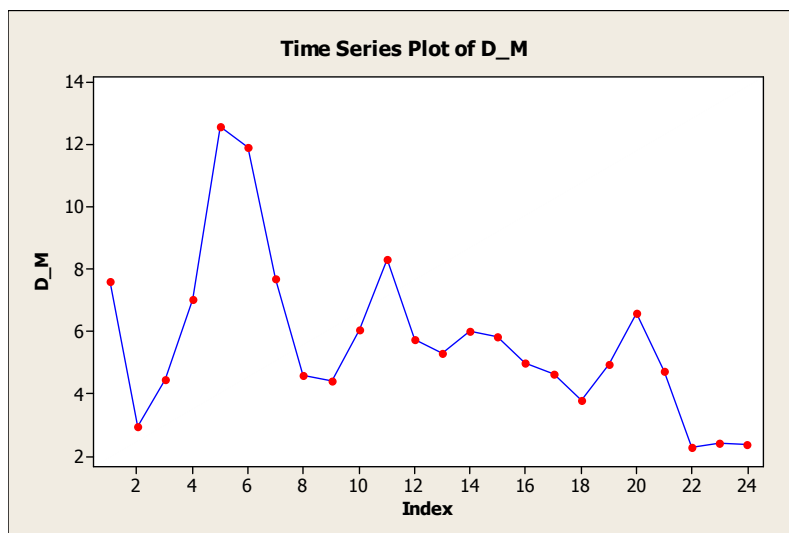
Figure 2. Time series plot during the study period

From the general chart of the previous series, its data follows the decreasing trend, as it started with the number of 7.60 and ended with the number of 2.35. As for the rest of the observations, they tend to increase or decrease.

1) Study of the series secular tends

By studying the trends of the series in general and following the method of trial and error, it was found that the best mathematical curve mediating the observations came among linear and quadratic forms, and the following table shows the findings of the accuracy indicators in both of the linear and the quadratic relationships.

Table 4. Findings of the study of the secular trend of the mortality to infection series

Accuracy metrics used	Secular tend	
	Linear	Quadratic
Mean Absolute Percentage Error (MAPE)	31.112	27.351
Mean Absolute Difference Error (MADE)	1.523	1.477
Mean square differences	4.772	4.355

The findings in the previous table confirmed that the alignment of the mathematical quadratic form exceeds the linear orientation at the level of all three measures of accuracy used. This was also confirmed by each of the following two graphs (Figures 3 and 4):
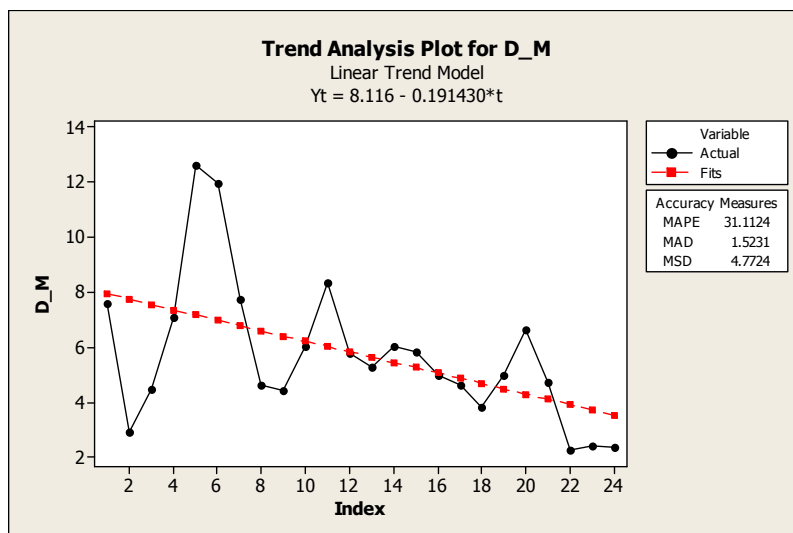
Figure 3. Shows the compatibility of the time series with the orientation of the mathematical relationship in the linear form
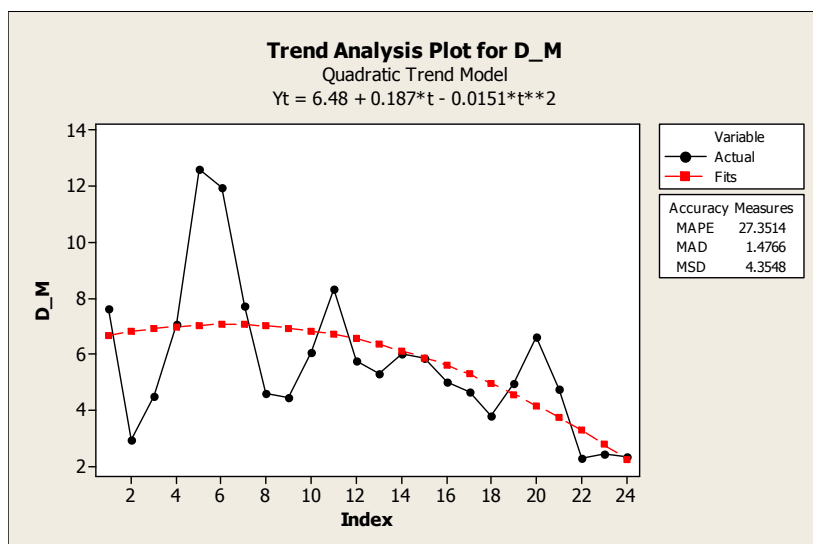
Figure 4. Displays the compatibility of the time series with the orientation of the mathematical relationship in quadratic form

Based on the foregoing, we can more accurately determine the mathematical form of the secular trend model.

$$Y_T = 6.48 + 0.187T - 0.0151T^2 \qquad (1)$$

2) Model Seasonality Study

In the following, the findings of the seasonality according to each of the additive models, and multiplicative models are presented. The following two figures (Figures 5 and 6) show some of the charts of the seasonal indices for each of the two models as follows:
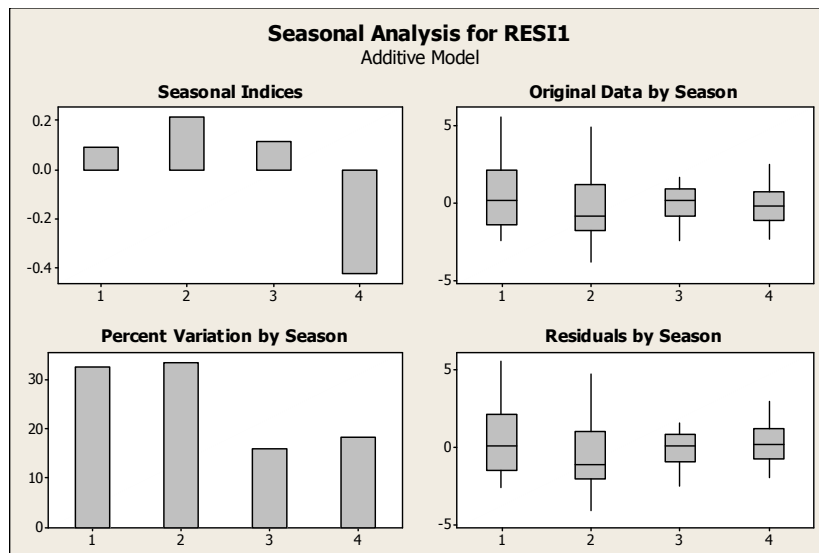
Figure 5. The findings of the seasonal indices according to the additive model
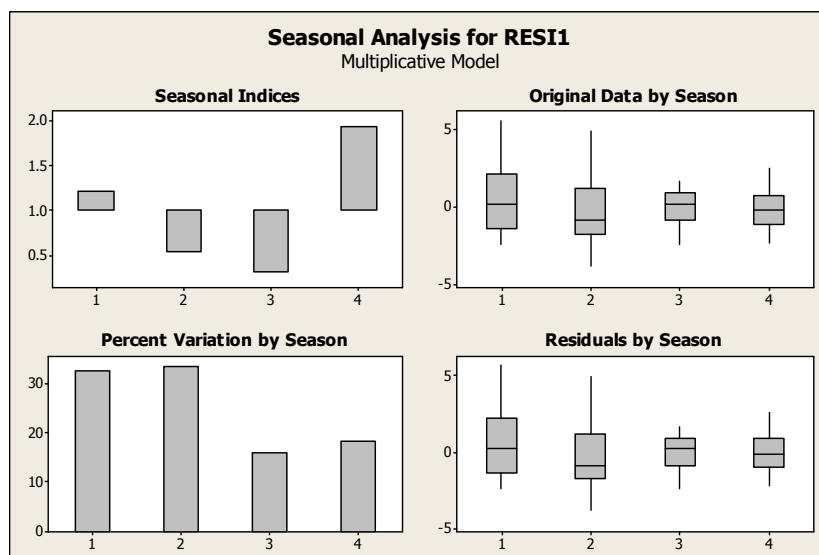
Figure 6. The findings of the seasonal indices according to the multiplicative model

The findings in both previous figures confirmed that there is a great variation in the findings of the Seasonal Indices in the multiplicative model compared to the additive model.

The following table presents the findings of the seasonal indices in each of the two models as follows:

Table 5. Seasonal indices findings in both additive and multiplicative models

Seasonal Index No.	Additive model	Multiplicative model
1	0.0953	1.2128
2	0.21406	0.5359
3	0.11406	0.3136
4	0.423440	1.9376

The previous table presents the values of the seasonal index during the period of the spread of the pandemic, in both the Additive and multiplicative models, respectively

3) Findings of accuracy measures for both the additive and the multiplicative models

Table 6. Findings of accuracy measures for both the additive and the multiplicative models

Seasonal Index No.	Additive model	Multiplicative model
Mean Absolute Percentage Error (MAPE)	159.505	109.656
Mean Absolute Difference Error (MADE)	1.512	1.469
Mean square differences (MSD)	4.386	4.369

The findings in the previous table confirmed the superiority of the findings of the three accuracy measures related to the multiplicative model in comparison to the additive model. The results of the three accuracy measures also confirmed that they are in favor of the results of the Multiplicative model.

Table 7. The findings of the seasonal indices in both the additive and multiplicative models

Seasonal Index No.	Additive model	Multiplicative model
1	0.0953	1.218
2	0.21406	0.5359
3	0.11406	0.3836
4	0.423440	1.9376

The previous table illustrate the parameter values of both the Additive and Multiplicative models, respectively

4) Findings of accuracy measures for both the additive and the multiplicative models

Table 8a. Findings of accuracy measures for both the additive and the multiplicative models

Accuracy metrics	Additive model	Multiplicative model
Mean Absolute Percentage Error (MAPE)	159.505	109.656
Mean Absolute Difference Error (MADE)	1.512	1.469
Mean square differences (MSD)	4.386	4.369

The findings in the previous table confirmed the superiority of the findings of the accuracy measures related to the multiplicative model in comparison to the additive model. The previous table presents the three accuracy measures for both the Additive and Multiplicative models, respectively.

Based on the foregoing, we can reject the validity of the first hypothesis in an absolute manner.

Table 8b. The final model for death to injwry ratio

Multiplicative Models	
1- Trend Analysis	
$Y_T = 6.48 + 0.187T - 0.0151T^2$	
2- Seasonal Indecess	Index Value
1	1.218
2	0.5359
3	0.3836
4	1.9376

4.2 Validity Test for the Second Hypothesis

To test the validity of the second hypothesis of the study, which states that "there are no statistically significant differences between the responses of the study sample in terms of some demographic variables about the follow-up of the number of infected persons, mortalities and recovering persons", the researcher used both tests: Mann-Whitney U Test and Kruskal-Wallis.

1) Findings related to gender (Table 1 in the Annexes)

presents the findings related to gender, which confirmed the existence of statistically significant differences

between the responses of both males and females with regard to "following up the cases of the celebrities who have recovered from coronavirus", as the value of the Mann-Whitney U Test (calculated Z 2.072), which confirms its statistical significance at a significance level of (0.05). The Descriptive statisticsas well as the average of ranks in the table confirmed that these differences and variances were in favor of the responses of females. As for the other items, the findings confirmed that there are no statistically significant differences between the responses of males and females, as none of them reached the level which makes one of them significant at a significance level of (0.05) at least, which means that females are more interested than males in following up on the spread of the virus, especially if the matter is related to the celebrities.

2) Findings related to the nature of the work in terms of the extent of their interaction and dealing with the public (Table 2 in the Annexes)

The findings confirmed that there are no statistically significant differences in terms of the nature of the work, as one of the values of the "Mann-Whitney test" did not reach the point that makes it significant at a significance level of (0.05) at least, as the nature and type of work did not play any role in the infection of individuals as they deal with the public directly or not, and this may be due to the role of the government in following many procedures that obligated banks, companies, and others, including reducing the labour force to 50% of its total capacity, as it imposed on everyone to follow precautionary measures and adhere to the distancing spaces prescribed between individuals in bodies, ministries, means of transportation, as well as in places of worship.

3) Findings related to marital status, especially dependency (Table 3 in the Annexes)

Illustrates the findings that confirmed the existence of statistically significant differences between the responses of parents who support or do not support dependents in terms of "following up on the daily numbers of mortalities". The "Man-Whitney test" reached the value of (calculated Z = 2.422), which confirms its statistical significance at the level of significance (0.05). The Descriptive statisticsin the table confirmed that these differences and variances were in favor of the responses of the sample of parents who do not support dependents, as they apply protection measures only to themselves. They have the time and effort to follow up on the numbers of infections and mortalities. As for the individuals considered under the study sample of dependency, they are most of the time interested in protecting and caring for their children and ensuring that their children or elderly dependents are wearing masks and using disinfectants and personal protection means. As for the other items, the findings confirmed that there are no statistically significant differences between the responses of parents who support or do not support dependents, as none of them reached the level, which it makes one of them significant at a significance level of (0.05) at least

4) Findings related to Educational Level: The findings (Table 4 in the Annexes)

confirmed the existence of "statistically significant differences in terms of educational level on the following elements:

① I followed with interest the daily numbers of infections The value of Kruskal-Wallis Test (Nonparametric Test) was (calculated Chi-squared = 14.141), which confirms its statistical significance at a significance level of (0.01), with degrees of freedom, equals (3) and by conducting the "Man-Whitney test", it was found that there are statistically significant differences between the responses of the intermediate education level with the rest of the other levels (University Degree – Master's – PhD). These differences between the two categories came separately at a significance level of (0.01), except for the recent comparison between those having intermediate qualifications and those having PhD degrees, whose findings came at a significance level of (0.05) only. As for the rest of the comparisons, they did not achieve the lowest levels of significance, and therefore there is no statistical significance between the findings of the other categories.

② I followed with interest the daily numbers of mortalities The value of the Kruskal-Wallis test was (calculated Chi-squared = 10.445), which confirms its statistical significance at a significance level of (0.05) with degrees of freedom equals (3), and by conducting the Mann-Whitney U test for two independent samples, it was found that there are statistically significant differences between the responses of the respondents of intermediate education level, and the others reaching university level education and master's degree. As for the remaining comparisons, they did not achieve the lowest levels of significance, and therefore there is no statistical significance between the findings of the other comparisons.

③ I followed with interest the daily numbers of infections The value of the Kruskal-Wallis test (calculated Chi-squared = 10.035), which confirms its statistical significance at a significance level of (0.05), with degrees of freedom (3), and by conducting the "Man-Whitney test" for two independent samples, it was found that there are statistical differences between the responses of intermediate education level with the rest of the other three

levels, and it reflects that there are significant differences between the intermediate level with both university and master's level at a significance level of (0.01) and with those holding PhD at the level of (0.05) only. The Descriptive statisticsconfirmed that these differences are in favor of the last three categories who were more interested in following up on the events compared to those who are holding a certificate of intermediate education. As for other comparisons, they did not achieve the lowest level of significance (0.05) at least.

④ I followed with interest the cases of the celebrities who died due to coronavirus infection The value of the Kruskal–Wallis test was (calculated Chi-squared = 9.223), which confirms its statistical significance at a significance level of (0.05) with degrees of freedom equals (3), and by conducting the Mann-Whitney U Test for two independent samples, it was found that there are statistically significant differences between the responses of the respondents of intermediate education level, and the others reaching university level education and master's degree at a significance level (0.01), and holders of PhD at the level of (0.05) only. As for the rest of the comparisons, they did not achieve the lowest levels of significance at (0.05) only. The Descriptive statisticsconfirmed that these differences are in favor of the last three groups who had the desire to know the course of events surrounding them compared to the holders of the certificate of intermediate education. This means that with the increase in the level of education, there is increased interest in following up on the deaths of celebrities.

As for the rest of the items, which are represented in the findings of the two items:

- I had followed with interest the cases of the celebrities who have tested positive for the coronavirus

- I had followed with interest the cases of the celebrities who have recovered from coronavirus

Its results did not achieve the lowest levels of significance, as it did not achieve the lowest levels of significance of (0.05) at least.

5) The findings related to the income level: The findings in (Table 5 in the Annexes) confirmed

That there are no statistically significant differences between the responses of individuals of different income levels at the level of the responses of the six elements, as one of the "Kruskal–Wallis" test values did not reach the minimum level of significance (0.05) at least. These findings indicate the state of anxiety and fear that reached the limit of depression, which was referred to by some of the aforementioned studies such as (Dodgson et al., 2020; Rajagopal, 2020).

Based on the foregoing, we can accept the validity of the second hypothesis in a partial manner, tending to the acceptance.

4.3 Validity Test for the Third Hypothesis

To test the validity of the third hypothesis of the study, which states that "there are no statistically significant differences between the responses of the study sample in terms of some demographic variables about the use of disinfectants and personal protection tools and means during the coronavirus pandemic," the researcher used "T" test for two independent samples and one-way analysis of variance.

The findings of the validity test for the third hypothesis of the study are as follows:

1) Findings related to gender

The findings of (Table 6 in the appendices) confirmed the existence of statistically significant differences in terms of gender about the private dimension "following the precautionary measures by the head of the family and their dependents". The value of the "T" test was (calculated T = 2.123), which confirms its statistical significance at the level of significance (0.05) with degrees of freedom (198), and the Descriptive statisticsconfirmed that these differences and variances were in favor of the male responses, the value of the arithmetic mean of their responses was (3.65 (compared to) 3.23) (only among females).

As for the findings:

- Buying and using disinfectants during Covid-19 pandemic.
- Buying and wearing masks by the head of the family and their dependents

The findings confirmed that there are no statistically significant differences between the responses of both males and females. This was confirmed by the Descriptive statisticsof their responses, represented by the values of the mean and average confidence interval of 95%.

2) Findings related to the nature of the job in terms of dealing with the public (Table 7 in the Annexes)

The findings confirmed that there are no statistically significant differences at the level of the dimensions and

variables of the use of disinfectants and personal protection tools in terms of the nature of the job and the extent of dealing with the public at the level of all three dimensions, as the values of the "T" test did not achieve the minimum, which makes one of them significant at a significance level of (0.05) at least.

3) Findings related to marital status in terms of dependency (Table 8 in the Annexes)

The findings confirmed that there are no statistically significant differences at the level of all three dimensions and variables in terms of the use of disinfectants and personal protection tools and the adoption of precautionary measures in terms of the nature of the marital status (dependency of the individual) at the level of all three dimensions, as the value of the "T" test did not achieve the minimum, which makes one of them at a significance level of (0.05) at least.

4) Findings related to educational level (Tables 9, 9-a, and 9-b in the Annexes)

The findings in the three tables In the Annexes confirmed that there are statistically significant differences in terms of:

- Buying and using disinfectants during COVID-19 pandemic.

- Buying and wearing masks by the head of the family and his dependents during the coronavirus pandemic.

The two values of the "F" test (calculated "F" = 4.606, 4.464), confirm their significance at a significance level of (0.01), with degrees of freedom (3, 196). By conducting the Tukey test for multiple comparisons, it was found that these differences and variances occur between the responses of the intermediate qualification with the rest of the other educational levels—as it was found that these differences and variances were in favor of the responses of the other three levels (University Degree – Master's – PhD).

5) The findings related to the income level (Table 10 in the Annexes)

It presents the findings of the income level, where the findings confirmed the existence of statistically significant differences in terms of the private dimension "Buy and use of disinfectants during the coronavirus pandemic", the value of the "F" test (calculated "F" = 3.118), which confirms its statistical significance at a significance level of (0.01) with degrees of freedom (3, 196). As a finding of the Tukey test for multiple comparisons, it was found that these differences and variances occur between the responses of the low-income group with the responses of some other income groups, which are limited to 4000-, -6000, 10000-, 30000 and more.

The Descriptive statisticsemphasized that these differences and variances were in favor of the responses of the latter income groups.

Based on the foregoing, we can accept the validity of the third hypothesis in a partial manner, tending to the acceptance.

Findings of the fourth hypothesis validity test: To test the validity of four hypotheses, which stipulates the following:

"There is no difference of statistical significance in terms of some demographic variables about the decision of getting vaccinated."

5. Discussion

The researcher used:

- "Z" test to study the difference between two independent sample ratios.

- "Kolmogorov–Smirnov test to identify the extent of independence between the two variables (Nonparametric Test). This test is often used as an alternative to the Chi-squared test to avoid some problems with the conditions of applying the Chi-squared test

- Chi-squared testing for independence between two variables. Also, the previous hypothesis must be reformulated through the following sub-hypotheses.

Sub-hypothesis (1): "There is no difference of statistical significance in terms of some demographic characteristics and the gender about the decision of getting vaccinated."

Sub-hypothesis (2): "There is no difference of statistical significance in terms of some demographic characteristics and the Jop, in particular dealing with the public.

Sub-hypothesis (3): "There is no difference of statistical significance in terms of some demographic characteristics, marital status and dependency about the decision of getting vaccinated."

Sub-hypothesis (4): "There is no difference of statistical significance in terms of some demographic

characteristics and educational qualification about the decision of getting vaccinated."

Sub-hypothesis (5): "There is no difference of statistical significance in terms of some demographic variables about the decision of getting vaccinated."

5.1 Findings of the Test of the Validity of the Tirst Sub-Hypothesis of the Fourth Hypothesis (Table 11 in the Annexes)

The findings confirmed that there are no statistically significant differences between the responses of the research sample's items about the decision to get vaccinated, according to gender. The findings of the "Z" test for the difference between two independent sample percentages and the "Kolmogorov–Smirnov test indicated that the extent of conviction about the importance and feasibility of vaccination as well as getting vaccinated are insignificant, as one of the two test values did not reach the point of making one of them significant at a significance level of (0.05) at least.

Based on the foregoing, we can accept the validity of the first Sub-hypothesis of the fourth hypothesis.

5.2 Findings of the Test of the Validity of the Second Sub-Hypothesis of the Fourth Hypothesis (Table 12 In the Annexes)

The findings of the second sub-hypothesis validation test, which states "there is no statistically significant difference in terms of some demographic characteristics (nature of work)" about the dimension of dealing with the public, were confirmed.

The findings confirmed that there are no statistically significant differences between the responses of the research sample's items about the decision to get vaccinated in terms of dealing with the public. The findings of the "Z" test for the difference between two independent sample percentages and the "Kolmogorov–Smirnov test are insignificant, as one of the two test values did not reach the point of making one of them significant at a significance level of (0.05) at least.

Based on the foregoing, we can accept the validity of the second Sub-hypothesis of the fourth hypothesis.

5.3 Findings of the Test of the Validity of the Third Sub-Hypothesis of the Fourth Hypothesis (Table 13 in the Annexes)

It presents the findings of the third sub-hypothesis of the fourth hypothesis validation test, which states that "there is no statistically significant difference in terms of some demographic characteristics (marital status - dependency)" about the decision of getting vaccinated. The findings therein confirmed that there are no statistically significant differences between the responses of the research sample's items about the decision to get vaccinated, with regard to marital status, especially the extent of dependency (crowding within the room), according to the findings of the "Z" test of the difference between two independent samples and the "Kolmogorov–Smirnov test", as one of the two test values did not reach the point of making one of them significant at a significance level of (0.05) at least.

Based on the foregoing, we can accept the validity of the third Sub-hypothesis of the fourth hypothesis.

5.4 Findings of the Test of the Validity of the Fourth Sub-Hypothesis of the Fourth Hypothesis (Table 14 in the Annexes)

It presents the findings of the fourth sub-hypothesis of the fourth hypothesis validity test, which states that "there is no statistically significant difference in terms of some demographic characteristics (education qualification)" The findings confirmed that there are no statistically significant differences between the responses of the research sample's items about the decision to get vaccinated, according to the educational level, as stated in the findings of the Chi-squared test, which did not reach the level at which it makes one of them significant at a significance level of (0.05) at least,

Based on the foregoing, we can accept the validity of the fourth Sub-hypothesis of the fourth hypothesis.

5.5 Findings of the Test of the Validity of the Fifth Sub-Hypothesis of the Fourth Hypothesis

It states that "there is no statistically significant difference in terms of some demographic characteristics, which is the level of income about the decision to get vaccinated" (Table 15 in the Annexes), which confirmed the existence of a relationship between the educational level **and each of:**

- **Access to Vaccination:** The value of the Chi-squared test was (calculated Chi-squared $=$ 9.519). This confirms its significance at a significance level of (0.05). This was confirmed by the frequency and Percentage distribution, which varied according to the level of income.

- **Number of doses received by the individual:** The value of the Chi-squared test was (calculated Chi-squared = 23.989), which confirms its statistical significance at a significance level of (0.01) with degrees of freedom of "8", and this was confirmed by the frequency and Percentage distribution, which varied according to income levels.

- **Vaccination Doses:** The value of the Chi-squared test was (calculated Chi-squared = 36.453), which confirms its statistical significance at a significance level (0.01). This was confirmed by the frequency and Percentage distribution, which varied according to income levels.

As for the other items in the following:

- The extent of conviction about the feasibility and importance of vaccination.

- The extent of spending on disinfection tools from monthly income.

Its results did not reach the level at which it makes one of them significant at a significance level of (0.05) at least,

The findings confirmed that those with high incomes followed the types of vaccines to protect them from the virus and were interested in receiving the doses announced by the Ministry of Health.

Based on the foregoing, we can reject the validity of the fifth Sub-hypothesis of the fourth hypothesis in a partial manner, rather than tending to acceptance.

Based on the foregoing, we can accept the validity of the fourth hypothesis in a partial manner, tending to the acceptance.

5.6 Findings Testing the Validity of the Fifth Hypothesis, Which Stipulates the Following

> "There is no relationship between demographic characteristics and infection and timing thereof at the level of all family members."

The researcher used the two-way frequency table and independence test "Chi-squared test", where tables (16, 17 in the Annexes) showed the results of the fifth hypothesis validity test.

Which confirmed the existence of a relationship between infection with the virus (COVID-19) and people infected with the virus from family members. The person who is forced to deal with the public under the nature of his work, we find that the probability of infection is higher than that of others, and the matter increases with the possibility of transferring the virus to all members of his family. As for the rest of the comparisons, there are no statistically significant differences in terms of dealing with the public and the rest of the other demographic variables. The findings also confirmed that there is no relationship between the five demographic variables (gender – nature of work – dealing with the public – family's dependency – level of education – income level) and the timing of infection with the virus (before – after) receiving doses.

Strangely, some received the vaccination and spent out of their monthly income on disinfecting tools and used disinfectants and personal protection and received vaccination doses, but they were infected with the disease, and from the study sample there is one who did not spend, did not use disinfectants and did not get infected even when administering only one dose, as this virus does not follow the common logic and this may be because it is a case under study.

Table 9. The Statistical Test and the rational behind it:

No. Hypothesis	Table in the Appendix	Statistical Test	Mention Applicable
2	Table 1	Mann-Whitney U test	Ranking Data for two Independent groups
	Table 2	Mann-Whitney U test	Ranking Data for two Independent groups
	Table 3	Mann-Whitney U test	Ranking Data for two Independent groups
	Table 4	Kruskal–Wallis Test + Mann-Whitney U test	Ranking Data for more than two Independent groups
	Table 5	Kruskal–Wallis Test + Mann-Whitney U test	Ranking Data for more than two Independent groups
3	Table 6	Descriptive Statistics + T-test	Real Data for two Independent groups
	Table 7	Descriptive Statistics + T-test	Real Data for two Independent groups
	Table 8	Descriptive Statistics + T-test	Real Data for two Independent groups
	Table 9	Descriptive Statistics + One-Way ANOVA + Tukey	Real Data for more than two Independent groups
	Table 10	Descriptive Statistics + One-Way ANOVA + Tukey	Real Data for more than two Independent groups
4	Table 11	Mann-Whitney U test + K–S Test	Nominal and Ranking Data for two Independent groups
	Table 12	Mann-Whitney U test + K–S Test	Nominal and Ranking Data for two Independent groups
	Table 13	Mann-Whitney U test + K–S Test	Nominal and Ranking Data for two Independent groups
	Table 14	Chi-squared Test	Testing for the Independency
	Table 15	Chi-squared Test	Testing for the Independency
5	Table 16	Chi-squared Test	Testing for the Independency

6. Conclusions

- There is an effect of the secular trend, and seasonality, on the trend of the time series for the ratio of mortalities to total infection during the study period. To further elaborate on the time series findings, the Multiplicative Model is the best and most representative of the findings of the Classic Time Series Analysis.

- Females are more interested than males in following up on cases of celebrities who have recovered from coronavirus.

- The educated and most cultured heads of families holding (University Degree – Master's – PhD) have represented the higher percentage in following the precautionary measures through buying and using disinfectants during the coronavirus pandemic period.

- Heads of the family having qualifications (University Degree – Master's – PhD) were interested in buying and wearing a mask for him and his dependents.

- The nature of the head of the family work in terms of (dealing with the public) does not affect his/her commitment to follow the precautionary measures.

- The educational level, especially (University Degree – Master's – PhD) has an effect on buying and using disinfectants during the Coronavirus pandemic, where the head of the family and his dependents are interested in emphasizing their use continuously.

- There is a difference in favor of middle- and high-income categories for buying and using disinfectants during the coronavirus pandemic (4000-, 6000-, 10,000+) compared to those under the low-income category (less than 2000).

- There is a keen interest in receiving vaccination doses recorded a higher percentage for high-income groups.

- There is a positive effect of vaccination doses in favor of those having higher income levels.

- There is no effect of demographic variables in the study in relation to infection of the individual and his/her dependents.

- There is no effect of the study demographic variables on the timing of the infection (before – after) the vaccination.

- There is no relationship between the Jop in terms of dealing with customers and infection of any of the dependent.

7. Recommendations

- Understanding the psychological factors that are driving consumer behavior and choices of products is a crucial element that helps analyze recent consumer behavior, especially with these unprecedented events that the world has experienced and researchers should study it in depth due to the novelty of the virus despite its existence for two years ago.

- Dealing with a flexibility more than usual with crises that affect society. There are sometimes some constant and logical facts that may not be achieved during crises, and marketing decision-makers must deal with them using a set of non-current policies, procedures and solutions that need to change some of the traditional constants.

- The Ministry of Health should avail of the findings of this study, which were summarized in the presence of a seasonal spread of the disease in each country in comparison to the others, and in Egypt, it appeared clearly in the period of the Khamsin, which includes (March-April-May). The concerned authorities should take and apply all necessary measures that help to reduce the number of mortalities due to the virus before its spread, in addition to the need to pay attention to the elderly.

- Increasing the intermediate education segment's awareness of the disease severity and promoting their interest in applying and following the precautionary procedures.

Compliance with ethical standards

Conflict of Interest: The authors declare that there is no conflict of interest regarding the publication of this paper.

Informed consent: Informed consent was obtained from all individual participants included in the study.

Data availability statements: Data is available from the authors upon reasonable request.

References

Akhtar, M. N., Usman, M., Ali, M., & Siddiqi, U. I. (2020). COVID-19 Restrictions and Consumers' Psychological Reactance Toward Offline Shopping Freedom Restoration. *The Service Industries Journal*, *40*(13/14), 891–913. https://doi.org/10.1080/02642069.2020.1790535

Ali, B. J. (2020). Impact of COVID-19 on consumer buying behavior toward online shopping in Iraq. *Economic Studies Journal*, *18*(42), 267–280. Retrieved from https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3729323

Arndt, J., Solomon, S., Kasser, T., & Sheldon, K. M. (2004). The Urge to Splurge: A Terror Management Account of Materialism and Consumer Behavior. *Journal of Consumer Psychology*, *14*, 198–212. https://doi.org/10.1207/s15327663jcp1403_2

Bentall, R. P., Lloyd, A., Bennett, K., McKay, R., Mason, L., & Murphy, J. (2021). Pandemic buying: Testing a psychological model of over-purchasing and panic buying using data from the United Kingdom and the Republic of Ireland during the early phase of the COVID-19 pandemic. *PLoS ONE*, *16*, e0246339. https://doi.org/10.1371/journal.pone.0246339

Burroughs, J. E., & Rindfleisch, A. (2005). Materialism and well-being: A conflicting values perspective. *Journal of Consumer Research*, *29*, 348–370. https://doi.org/10.1086/344429

Cannito, L., Anzani, S., Bortolotti, A., Palumbo, R., Ceccato, I., & Di Crosta, A. (2021). Temporal Discounting of Money and Face Masks During the COVID-19 Pandemic: The Role of Hoarding Level. *Front Psychol.*, *12*, 642102. https://doi.org/10.3389/fpsyg.2021.642102

Central Agency for Public Mobilization and Statistics, Series of researches and exploratory studies about Coronavirus in Egypt. Released between March 2020 To February 2022. Retrieved from https://www.capmas.gov.eg/Pages/Researchs.aspx?page_id=5031

Chirumbolo, A., Callea, A., & Urbini, F. (2021). The Effect of Job Insecurity and Life Uncertainty on Everyday Consumptions and Broader Life Projects during COVID-19 Pandemic. *International Journal of Environmental Research and Public Health*, *18*, 5363. https://doi.org/10.3390/ijerph18105363

Chua, G., Yuen, K. F., Wang, X., & Wong, Y. D. (2021). The Determinants of Panic Buying during COVID-19. *International Journal of Environmental Research and Public Health*, *18*, 3247. https://doi.org/10.3390/ijerph18063247

Clemens, K. S., Matkovic, J., Faasse, K., & Geers, A. L. (2020). Determinants of Safety-Focused Product Purchasing in the United States at the beginning of the Global COVID-19 Pandemic. *Safety Science*, *130*, 104894. https://doi.org/10.1016/j.ssci.2020.104894

Cranfield, J. A. L. (2020). Framing Consumer Food Demand Responses in a Viral Pandemic. *Canadian Journal of Agricultural Economics*, *68*(2), 151−156. https://doi.org/10.1111/cjag.12246

Degliespostip, M. A., & Roberti, G. (2021). Sharingand Sustainable Consumption in the Era of COVID-19. *Sustainability*, *13*, 1903. https://doi.org/10.3390/su13041903

Di Crosta, A., Ceccato, I., Marchetti, D., La Malva, P., Maiella, R., & Cannito, L. (2021). Psychological factors and consumer behavior during the COVID19 pandemic. *PLoS ONE*, *16*(8), e0256095. https://doi.org/10.1371/journal.pone.0256095

Diebner, R., Silliman, E., Ungerman, K., & Vancauwenberghe, M. (2020). *Adapting customer experience in the time of coronavirus*. McKinsey & Company. Retrieved September 10, 2020, from https://www.mckinsey.com/capabilities/growth-marketing-and-sales/our-insights/adapting-customer-experience-in-the-time-of-coronavirus

Dodgson, L. A. (2020). *A human behavior expert explains 4 psychological reasons why people are panic buying items in bulk during the coronavirus pandemic*. Retrieved from https://www.insider.com/why-people-are-panic-bulk-buying-during-the-coronavirus-pandemic-2020-3

Duhachek, A. C. (2005). A Multidimensional, Hierarchical Framework of Responses to Stressful Consumption Episodes. *Journal of Consumer Research*, *32*(1), 41−53. https://doi.org/10.1086/426612

Henry, J. (2011). Biological Basis of the Stress Response. *Physiology*, *8*, 69−73. https://doi.org/10.1152/physiologyonline.1993.8.2.69

Jeżewska-Zychowicz, M., Plichta, M., & Krolak, M. (2020). Consumers' Fears Regarding Food Availability and Purchasing Behaviors during the COVID-19 Pandemic: The Importance of Trust and Perceived Stress. *Nutrients*, *12*, 2852. https://doi.org/10.3390/nu12092852

Kennett-Hensel, P. A., Sneath, J. Z., & Lacey, R. (2012). Liminality and consumption in the aftermath of a natural disaster. *Journal of Consumer Marketing*, *29*, 52−63. https://doi.org/10.1108/07363761211193046

Knowles, J. R., Ettenson, P. L., & Dollens, J. (2020). Growth opportunities for brands during the COVID-19 crisis. *MIT Sloan Management Review: Cambridge*, *61*(4), 2−6.

Laura, R., & Jiri, K. (2021). Cognitive Attitudes, Behavioral Choices, and Purchasing Habits during the COVID-19 Pandemic. *Journal of Self-Governance and Management Economics*, *9*(4), 35−47. https://doi.org/10.22381/jsme9420213

Lins, S., & Aquino, S. (2020). Development and initial psychometric properties of a panic buying scale during COVID-19 pandemic. *Heliyon*, *6*, e04746. https://doi.org/10.1016/j.heliyon.2020.e04746

Nielsen, I. Q. (2020). *Key consumer behavior thresholds identified as the Coronavirus outbreak evolves*. Retrieved July 20, 2020, from https://nielseniq.com/global/en/insights/analysis/2020/key-consumer-behavior-thresholds-identified-as-the-coronavirus-outbreak-evolves-2/

Perez, S. (2020). *Pandemic helped drive Walmart commerce sales up 97% in second quarter*. Tech Crunch. Retrieved from https://techcrunch.com/2020/08/18/

Rajagopal. (2020). Development of Consumer Behavior. In *Transgenerational Marketing: Evolution, Expansion, and Experience* (pp. 163−194). Cham: Springer International Publishing. https://doi.org/10.1007/978-3-030-33926-5_6

Ruggless, R. (2020, March 15). *How should restaurants clean in coronavirus cases*? Nation's Restaurant News. Retrieved from https://www.nrn.com/operations/how-should-restaurants-clean-coronavirus-cases

Sheth, J. (2020). Impact of COVID-19 on Consumer Behavior: Will the Old Habits Return or Die? *Journal of Business Research*, *117*, 280–283. https://doi.org/10.1016/j.jbusres.2020.05.059

Song, W., Jin, X., Gao, J., & Zhao, T. (2020). Will Buying Follow Others Ease Their Threat of Death? An Analysis of Consumer Data during the Period of COVID-19 in China. *International Journal of Environmental Research and Public Health*, *17*, 3215. https://doi.org/10.3390/ijerph17093215

The Egyptian Council of Ministers. (2022). *The Egyptian Cabinet's Information and Decision Support Center (IDSC), The novel coronavirus and its spread locally and globally, a series of issues from (1) to (31)*. Released between March 2020 and February 2022. Retrieved from https://www.care.gov.eg/EgyptCare/DocumentLibrary/Browse.aspx

Yuen, K. F., Wang, X., Ma, F., & Li, K. X. (2020). The Psychological Causes of Panic Buying Following a Health Crisis. *International Journal of Environmental Research and Public Health*, *17*, 3513. https://doi.org/10. 3390/ijerph17103513

World Health Organization. (2022). *Seires of situation reports about Coronavirus disease*. Released between March 2020 and February 2022. Retrieved from https://apps.who.int/iris/discover?locale-attribute=ar&group_by=none&etal=0&query=Coronavirus%20dis ease%20(%E2%80%8ECOVID-19)%E2%80%8E:%20situation%20report&page=11&rpp=10

Appendix A

Table 1. Extent of differences in following up the numbers of infected persons, mortalities and recovering persons as per gender (male/female)

Items	Gender	Descriptive Statistics			"Z" Value	Level of Significance
		Arithmetic Mean	Standard Deviation	Mean Ranks		
1. I had followed with interest the daily numbers of infections	Male	3.292	1.289	100.73	0.057	0.955
	Female	3.285	0.832	100.29		(Non-significant)
2. I had followed with interest the daily numbers of mortalities	Male	3.219	1.323	102.69	0.534	0.594
	Female	3.115	0.948	98.48		(Non-Significant)
3. I had followed with interest the daily numbers of recovering persons	Male	3.073	1.172	99.83	0.169	0.866
	Female	3.096	0.887	101.12		(Non-Significant)
4. I had followed with interest the cases of the celebrities who have tested positive for the coronavirus	Male	2.635	1.306	93.49	1.710	0.087
	Female	2.923	1.112	106.97		(Non-Significant)
5. I had followed with interest the cases of the celebrities who have recovered from coronavirus	Male	2.594	1.261	92.04	2.072	0.038 (Significant at 0.05 level)
	Female	2.942	1.104	108.31		
6. I had followed with interest the cases of the celebrities who died due to coronavirus infection	Male	2.667	1.295	93.17	1.792	0.073
	Female	2.962	1.088	107.27		(Non-Significant)

Table 2. Differences in following up the numbers of infected persons, mortalities and recovering persons (dealing with the public)

Items	Dealing with the Public	Descriptive Statistics			Mann-Whitney U Test	
		Mean Ranks	Arithmetic Mean	Standard Deviation	"Z" Value	Level of Significance
1. I had followed with interest the daily numbers of infections	No	108.10	3.438	1.055	1.756	0.079
	Yes	94.41	3.171	1.078		(Non-Significant)
2. I had followed with interest the daily numbers of mortalities	No	108.34	3.315	1.163	1.783	0.075
	Yes	94.21	3.045	1.115		(Non-Significant)
3. I had followed with interest the daily numbers of recovering persons	No	107.43	3.214	1.071	1.632	0.103
	Yes	94.95	2.992	0.991		(Non-Significant)
4. I had followed with interest the cases of the celebrities who have tested positive for the coronavirus	No	107.45	2.933	1.232	1.580	0.114
	Yes	94.93	2.667	1.193		(Non-Significant)
5. I had followed with interest the cases of the celebrities who have recovered from coronavirus	No	107.73	2.933	1.232	1.651	0.099
	Yes	94.70	2.649	1.149		(Non-Significant)
6. I had followed with interest the cases of the celebrities who died due to coronavirus infection	No	105.57	2.933	1.232	1.155	0.248
	Yes	96.43	2.730	1.167		(Non-Significant)

Table 3. Differences in following up the numbers of infected persons, mortalities and recovering persons (Dependency)

Items	Dependency	Descriptive Statistics			Mann-Whitney U Test	
		Mean Ranks	Arithmetic Mean	Standard Deviation	"Z" Value	Level of Significance
1. I had followed with interest the daily numbers of infections	Not support dependents	110.07	3.490	1.027	1.145	0.148
	Support dependents	97.22	3.222	1.083		(Non-Significant)
2. I had followed with interest the daily numbers of mortalities	Not support dependents	116.80	3.490	1.137	2.422	0.015
	Support dependents	94.92	3.054	1.126		(Significant at 0.05 level)
3. I had followed with interest the daily numbers of recovering persons	Not support dependents	109.65	3.294	1.118	1.408	0.159
	Support dependents	97.37	3.013	0.993		(Non-Significant)
4. I had followed with interest the cases of the celebrities who have tested positive for the coronavirus	Not support dependents	109.54	2.961	1.165	1.343	0.179
	Support dependents	97.41	2.725	1.229		(Non-Significant)
5. I had followed with interest the cases of the celebrities who have recovered from coronavirus	Not support dependents	112.11	3.000	1.148	1.732	0.083
	Support dependents	96.53	2.698	1.200		(Non-Significant)
6. I had followed with interest the cases of the celebrities who died due to coronavirus infection	Not support dependents	112.51	3.039	1.131	1.787	0.074
	Support dependents	96.39	2.745	1.214		(Non-Significant)

Table 4. Differences in the following up on the numbers of infected persons, mortalities and recovering persons as per the Education Level

Items	Kruskal–Wallis Test Results				Education Level	Mann-Whitney U Test Results			
	Education Level	Mean Ranks	Chi-squared (d.f = 3)	Level of Significance		Intermediate Education	University Education	Master's	Doctorate
1. I had followed with interest the daily numbers of infections	Intermediate Education	46.33	14.141	0.003 (Significant at 0.01 level)	Intermediate Education	-	3.633**	2.629**	2.552*
	University Education	106.25			University Education		-	1.326	0.012
	Master's	92.13			Master's			-	0.805
	Doctorate	105.83			Doctorate				-
2. I had followed with interest the daily numbers of mortalities	Intermediate Education	52.58	10.445	0.015 (Significant at 0.05 level)	Intermediate Education	-	3.108**	2.734**	1.861
	University Education	105.53			University Education		-	0.406	0.962
	Master's	101.25			Master's			-	0.553
	Doctorate	92.06			Doctorate				-
3. I had followed with interest the daily numbers of recovering persons	Intermediate Education	53.92	10.035	0.018 (Significant at 0.05 level)	Intermediate Education	-	3.058**	2.676**	2.353*
	University Education	103.52			University Education		-	0.386	0.484
	Master's	99.33			Master's			-	0.838
	Doctorate	110.00			Doctorate				-
4. I had followed with interest the cases of the celebrities who have tested positive for the coronavirus	Intermediate Education	63.17	6.739	0.081 (Non-Significant)	Intermediate Education	-			
	University Education	100.94			University Education		-		
	Master's	112.17			Master's			-	
	Doctorate	102.56			Doctorate				-
5. I had followed with interest the cases of the celebrities who have recovered from coronavirus	Intermediate Education	63.33	7.297	0.063 (Non-Significant)	Intermediate Education	-			
	University Education	100.79			University Education		-		
	Master's	114.45			Master's			-	
	Doctorate	99.81			Doctorate				-
6. I had followed with interest the cases of the celebrities who died due to coronavirus infection	Intermediate Education	57.17	9.223	0.026 (Significant at 0.05 level)	Intermediate Education	-	2.623**	3.057**	2.204*
	University Education	100.81			University Education		-	1.241	0.201
	Master's	114.37			Master's			-	0.578
	Doctorate	103.83			Doctorate				-

Table 5. Differences in the following up on the numbers of infected persons, mortalities and recovering persons as Per the Income Segments

Items	Income Segments	Descriptive Statistics			Mann-Whitney U Test Results	
		Mean Ranks -	Arithmetic Mean	Standard Deviation	Chi-squared (d.f =8)	Level of Significance
1. I had followed with interest the daily numbers of infections	Less than 2000	112.60	3.458	1.383	6.53	0.585
	-2000	100.27	3.273	1.039		(Non-Significant)
	-4000	108.60	3.444	1.182		
	-6000	80.87	2.913	1.125		
	-8000	93.29	3.143	0.899		
	-10000	96.32	3.194	0.910		
	-15000	92.50	3.222	0.646		
	-20000	100.00	3.308	1.109		
	30000 or more	114.33	3600	1.056		
2. I had followed with interest the daily numbers of mortalities	Less than 2000	104.10	3.208	1.503	4.508	0.809
	-2000	105.83	3.273	1.206		(Non-Significant)
	-4000	103.61	3.250	1.204		
	-6000	87.07	2.869	1.179		
	-8000	100.79	3.143	0.899		
	-10000	89.69	2.935	0.928		
	-15000	109.78	3.333	0.686		
	-20000	93.54	3.077	1.115		
	30000 or more	113.23	3.457	1.187		
3. I had followed with interest the daily numbers of recovering persons	Less than 2000	94.38	3.958	1.429	2.872	0.942
	-2000	105.70	3.212	1.192		(Non-Significant)
	-4000	102.72	3.111	1.036		
	-6000	95.57	3.957	1.147		
	-8000	86.71	2.857	0.690		
	-10000	100.61	3.065	0.854		
	-15000	96.00	3.000	0.00		
	-20000	96.15	3.000	0.816		
	30000 or more	116.47	3.467	1.060		
	Income Segments	Descriptive Statistics			Mann-Whitney U Test	
		Mean Ranks	Arithmetic Mean	Standard Deviation	Chi-squared (d.f =8)	Level of Significance
4. I had followed with interest the cases of the celebrities who have tested positive for the coronavirus	Less than 2000	96.77	2.708	1.489	14.548	0.69
	-2000	120.29	3.212	1.243		(Non-Significant)
	-4000	101.92	2.861	1.268		
	-6000	84.11	2.348	1.265		
	-8000	96.93	2.714	0.755		
	-10000	101.94	2.807	1.108		
	-15000	101.33	2.778	0.428		
	-2000	60.12	1.923	0.862		
	3000 or more	117.37	3.200	1.373		
5. I had followed with interest the cases of the celebrities who have recovered from coronavirus	Less than 2000	101.94	2.792	1.473	13.729	0.89
	-2000	117.26	3.152	1.277		(Non-Significant)
	-4000	102.43	2.833	1.158		
	-6000	84.54	2.348	1.265		
	-8000	89.14	2.571	0.534		
	-10000	102.13	2.807	1.108		
	-15000	101.11	2.778	0.428		
	-20000	59.81	1.923	0.826		
	30000 or more	117.63	3.200	1.373		
6. I had followed with interest the cases of the celebrities who died due to coronavirus infection	Less than 2000	94.88	2.708	1.358	10.694	0.220
	-2000	115.39	3.152	1.277		(Non-Significant)
	-4000	104.72	2.944	1.286		
	-6000	82.65	2.348	1.265		
	-8000	87.14	2.571	0.534		
	-10000	102.48	2.871	1.024		
	-15000	105.56	2.889	0.323		
	-20000	70.62	2.154	1.143		
	30000 or more	115.93	3.200	1.373		

Table 6. Differences in the dimensions of the variables of the use of disinfectants and personal protection tools and means – Gender

Variables of precautionary measures	Gender	Data Descriptive Statistics			T-test (d.f)	Level of Significance
		Arithmetic Mean	Standard Deviation	Confidence Interval for Mean with 95%		
Buying and using disinfectants during the Covid-19 pandemic.	Male	3.922	0.808	(3.758, 4.096)	0.600	0.549
	Female	3.724	0.691	(3.851, 4.120)	(198)	(Non-Significant)
2. Buying and wearing a mask by the head of the family and their dependents	Male	3.628	0.990	(3.427, 3.828)	0.808	0.420
	Female	3.724	0.637	(3.600, 3.847)	(160)	(Non-Significant)
Following the precautionary measures by the head of the family and his dependents	Male	3.565	0.877	(3.387, 3.743)	2.123	0.035
	Female	3.325	0.722	(3.184, 3.465)	(198)	(Significant at 0.05 level)

Table 7. Differences in the dimensions and variables of the use of disinfectants and personal protection tools – of the job

Variables of precautionary measures	Nature of Job	Data Descriptive Statistics			T-test (d.f)	Level of Significance
		Arithmetic Mean	Standard Deviation	Confidence Interval for Mean with 95%		
1. Buying and using disinfectants during the Covid-19 pandemic.	No	4.039	0.627	(3.907، 4.171)	1.474	0.142
	Yes	3.887	0.830	(3.731، 4.044)	(197)	(Non-Significant)
2. Buying and wearing masks by the head of the family and their dependents	No	3.733	0.805	(3.564, 3.903)	0.854	0.394
	Yes	3.633	0.841	(3.475, 3.791)	(198)	(Non-Significant)
3. Following the precautionary measures by the head of the family and his dependents	No	3.480	0.876	(3.296, 3.665)	0.632	0.528
	Yes	3.408	0.751	(3.266, 3.549)	(198)	(Non-Significant)

Table 8. Differences in the dimensions and variables of the use of disinfectants and personal protection tools – marital status

Variables of precautionary measures	Existence of dependency	Data Descriptive Statistics			T-test (d.f)	Level of Significance
		Arithmetic Mean	Standard Deviation	Confidence Interval for Mean with 95%		
1. Buying and using disinfectants during the Covid-19 pandemic.	NA	3.902	0.749	(3.692, 4.113)	0.585	0.559
	Applicable	3.973	0.751	(3.852, 4.095)	(198)	(Non-Significant)
2. Buying and wearing masks by the head of the family and his dependents during the coronavirus pandemic.	NA	3.716	0.648	(3.533, 3.898)	0.443	0.659
	Applicable	3.664	0.879	(3.522, 3.807)	(117)	(Non-Significant)
3. Following the precautionary measures by the head of the family and his dependents	NA	3.466	0.820	(3.235, 3.793)	0.263	0.793
	Applicable	3.431	0.806	(3.301, 3.562)	(198)	(Non-Significant)

Table 9. Differences in the dimensions and variables of the use of disinfectants and personal protection tools – educational level

Variables of precautionary measures	Education Level	Data Descriptive Statistics			F-test (d.f=3, 196)	Level of Significance
		Arithmetic Mean	Standard Deviation	Confidence Interval for Mean with 95%		
Buying and using disinfectants during the Covid-19 pandemic.	Intermediate Education	3.208	1.287	(2.390, 4.026)	4.606	0.004 (Significant at 0.01 level)
	University Education	3.982	0.664	(3.871, 4.093)		
	Master's	4.067	0.537	(3.866, 4.267)		
	Doctorate	4.056	0.983	(3.567, 4.545)		
2. Buying and wearing masks by the head of the family and his dependents during the coronavirus pandemic.	Intermediate Education	2.854	1.189	(2.099, 3.609)	4.464	0.005 (Significant at 0.01 level)
	University Education	3.729	0.715	(3.609, 3.848)		
	Master's	3.733	0.928	(3.387, 4.080)		
	Doctorate	3.736	0.537	(3.270, 4.202)		
3. Following the precautionary measures by the head of the family and his dependents	Intermediate Education	3.021	0.767	(2.521, 3.521)	2.103	0.101 (Non-Significant)
	University Education	3.470	0.778	(3.340, 3.600)		
	Master's	3.308	0.921	(2.965, 3.652)		
	Doctorate	3.708	0.778	(3.322, 4.095)		

Table 9-a. The results of the Tukey test for multiple comparisons between educational levels and the purchase and use of disinfectants

Education Level:	Intermediate Education	University Education	Master's	Doctorate
Intermediate Education	--	0.778[*]	0.858[*]	0.847[*]
University Education		--	0.084	0.073
Master's			--	0.011
Doctorate				--

Note. * It indicates that there are statistically significant differences between the results of the responses of the intermediate education category with the rest of the educational levels.

Table 9-b. The results of the Tukey test for multiple comparisons between educational levels and the purchase and use of masks

Education Level	Intermediate Education	University Education	Master's	Doctorate
Intermediate Education	--	0.874[*]	0.879[*]	0.882[*]
University Education		--	0.005	0.007
Master's			--	0.003
Doctorate				--

Note. * It indicates that there are statistically significant differences between the results of the responses of the intermediate education category with the rest of the educational levels.

Table 10. Differences in the dimensions and variables of the use of disinfectants and personal protection means −
in terms of income level

Statements	Income Segments	Data Descriptive Statistics			T-test (d.f)	Level of Significance
		Arithmetic Mean	Standard Deviation	Confidence Interval for Mean with 95%		
Buying and using disinfectants during the Covid-19 pandemic.	Less than EGP 2000-	3.333	0.974	(2.922, 3.745)	3.118	0.002 (Significant at 0.01 level)
	2000-	3.894	0.748	(3.629, 4.159)		
	4000 –	4.153	0.653	(3.932, 4.374)		
	6000 –	4.044	0.825	(3.687, 4.400)		
	8000-	3.857	0.378	(3.508, 4.207)		
	10000-	4.032	0.836	(3.726, 4.339)		
	15.000-	3.944	0.162	(3.864, 4.025)		
	200000-	4.077	0.572	(3.731, 4.422)		
	30000 or more	4.267	0.458	(4.013, 4.52)		
2. Buying and wearing a mask by the head of the family and their dependents	Less than 2000	3.417	0.985	(3.001, 3.833)	1.809	0.771 (Non-Significant)
	2000-	3.591	0.720	(3.331, 3.846)		
	4000-	3.944	0.592	(3.744, 4.145)		
	6000-	3.478	0.790	(3.137, 3.82)		
	8000-	3.286	0.603	(2.728, 3.843)		
	100000-	3.686	0.913	(3.351, 4.020)		
	15000-	3.861	0.516	(3.605, 4.118)		
	20000-	3.500	1.291	(2.720, 4.280)		
	30000 or more	4.050	0.808	(3.602-4.498)		
3. Following the precautionary measures by the head of the family and his dependents	Less than 2000	3.375	0.841	(3.020, 3.730)	1.674	0.107 (Non-Significant)
	2000-	3.288	-0.685	(3.045, 3.531)		
	4000-	3.549	0.790	(3.281, 3.816)		
	60000-	3.239	0.576	(3.00, 3.488)		
	80000-	3.00	0.479	(2.557, 3.443)		
	10000-	3.790	0.966	(3.436, 4.145)		
	15000-	3.472	0.507	(3.220, 3.724)		
	20000-	3.192	1.225	(2.452, 3.933)		
	30000 or more	3.583	0.806	(3.137, 4.029)		

Table 10-a. Findings of multiple comparisons between income purchases represented in terms of purchasing and
wearing masks by the family

Income Segments	Less than 2000	2000-	4000-	6000-	8000-	10000-	15000-	20000-	3000 or more
Less than 2000	-	0.560	0.819*	0.710*	0.523	0.698*	0.611	0.744*	0.933*
-2000		-	0.258	0.149	0.037	0.138	0.050	0.183	0.372
-4000			-	0.109	0.295	0.120	0.208	0.076	0.114
-6000				-	0.186	0.011	0.099	0.033	0.223
-8000					-	0.175	0.087	0.219	0.409
-10000						-	0.087	0.045	0.234
-15000							-	0.132	0.322
-20000								-	0.322
-3000 or more									-

Table 11. Findings of the study of some variables of the decision to get vaccinated with some demographic variables – gender

Statements	Male ($N_1 = 96$)		Female ($N_2 = 104$)		Result of "Z" Test	
	Number	%	Number	%	"Z" Value	Level of Significance
Satisfaction with the importance of vaccination	68	70.8	70	67.3	0.54	0.58 (Non-Significant)
The extent of access to vaccination	86	89.6	92	88.5	0.25	0.800 (Non-Significant)
Freq. and proportional distribution - "Kolmogorov–Smirnov test"						
Statements	Freq.	%	Freq.	%	K–S Test	Level of Significance
Several doses received:						
- 1st Dose	6	7.00	4	4.3	0.463	0.983 (Non-Significant)
- 1st and 2nd Doses	60	69.8	73	79.3		
- 1st, 2nd and 3rd Doses	20	23.3	15	16.3		
The extent of pain during and after vaccination:						
- I felt pain after every dose.	40	46.5	42	45.7	0.07	0.998
- I did not feel pain after every dose.	32	37.2	36	39.1		(Non-Significant)
- I felt pain only after the first dose.	14	16.3	14	15.2		
The extent of expenditure on personal protection tools and means						
- I did not spend my income.	5	5.2	-	-	.368	.899 (Non-Significant)
- less than 5% of my income	43	44.8	50	48.1		
- From 5% to less than 10%	33	34.4	42	41.3		
- From 10% to less than 20%	13	13.5	9	8.7		
- 20% or more	2	2.1	2	1.9		

Table 12. Findings of the study of some variables of the decision to get vaccinated with some demographic variables – dealing with public

Statements	Not Dealing with Public		Dealing with the Public		Result of "Z" Test	
	Number	%	Number	%	"Z" Value	Level of Significance
Satisfaction with the importance of vaccination	60	67.40	78	70.3	0.43	0.665 (Non-Significant)
The extent of access to vaccination	77	86.5	101	91.00	0.88	0.378 (Non-Significant)
Freq. and proportional distribution - "Kolmogorov–Smirnov test"						
Statements	Freq.	%	Freq.	%	K–S Test	Level of Significance
Several doses received:						
- 1st Dose	4	5.2	6	5.9	0.886	0.412
- 1st and 2nd Doses	52	67.5	81	80.2		(Non-Significant)
- 1st, 2nd and 3rd Doses	21	27.3	14	13.9		
The extent of pain during and after vaccination:						
- I felt pain after every dose.	40	51.9	42	41.6	0.685	0.736
- I did not feel pain after every dose.	23	29.9	45	44.6		(Non-Significant)
- I felt pain only after the first dose.	14	18.2	14	13.8		
The extent of expenditure on personal protection tools and means						
- I did not spend my income.	-	-	5	4.5	0.625	0.830
- less than 5% of my income	48	53.9	45	40.5		(Non-Significant)
- From 5% to less than 10%	32	36.0	44	39.6		
- From 10% to less than 20%	7	7.9	15	13.5		
- 20% or more	2	2.2	2	1.8		

Table 13. Findings of the study of some variables of the decision to get vaccinated with some demographic variables – Dependency

Statements	I do not support dependents (N_1 = 51)		I support dependents (N_2 = 149)		Result of "Z" Test	
	Number	%	Number	%	"Z" Value	Level of Significance
Satisfaction with the importance of vaccination	35	68.6	103	69.1	0.07	0.947 (Non-Significant)
The extent of access to vaccination	44	86.3	134	89.9	0.68	0.499 (Non-Significant)
Freq. and proportional distribution - "Kolmogorov–Smirnov test"						
Statements	Freq.	%	Freq.	%	K–S Test	Level of Significance
Several doses received:						
- 1st Dose	8	18.2	2	1.5		
- 1st and 2nd Doses	26	59.1	107	79.9	0.886	0.412 (Non-Significant)
- 1st, 2nd and 3rd Doses	15	22.7	25	18.7		
The extent of pain during and after vaccination:						
- I felt pain after every dose.	17	38.6	65	48.5		
- I did not feel pain after every dose.	15	34.1	53	39.6	0.685	0.736 (Non-Significant)
- I felt pain only after the first dose.	12	27.3	16	11.9		
The extent of expenditure on personal protection tools and means						
- I did not spend my income.	-	-	5	3.3	0.685	0.736 (Non-Significant)
- less than 5% of my income	23	45.1	70	47.0		
- From 5% to less than 10%	18	35.3	58	38.9		
- From 10% to less than 20%	10	19.6	12	8.1		
- 20% or more	-	-	4	2.7		

Table 14. Findings of the study of some variables of the decision to get vaccinated with some demographic variables – Qualification

Statements	Vaccination doses	Intermediate Qualification		University Qualification		Post-graduate Education		Chi-squared test results	
		Numbers	%	Numbers	%	Numbers	%	Chi-squared (d.f)	Level of Significance
The extent of conviction about the feasibility and importance of vaccination	No	3	25.00	40	28.6	19	39.6	2.241 (2)	0.326 (Non-Significant)
	Yes	9	75.00	100	71.4	29	60.4		
Access to vaccination	No	2	16.7	16	11.4	4	8.3	0.769 (2)	0.681 (Non-Significant)
	Yes	10	83.3	124	88.6	44	91.7		
Number of doses received	First	-	-	10	8.1	-	-	6.630 (4)	0.157 (Non-Significant)
	Second	8	80.00	87	70.2	38	86.4		
	1st, 2nd and 3rd Doses	2	20.00	27	21.8	6	13.6		
The extent of pain during and after vaccination:									
- I felt pain after every dose.	First	17	70.0	55	44.4	20	45.5	3.201 (4)	0.525 (Non-Significant)
- I did not feel pain after every dose.	Second	3	30.0	48	38.7	17	38.5		
- I felt pain only after the first dose.	1st, 2nd and 3rd Doses	-	-	21	16.9	7	15.9	4.275 (4)	0.370 (Non-Significant)
The extent of expenditure on personal protection tools and means									
- from 5% -	First	8	66.6	64	45.7	26	54.2		
- from 10% -	Second	2	16.7	59	42.1	15	31.2		
- 20% or more	1st, 2nd and 3rd Doses -	2	16.7	17	12.1	7	14.5		

Table 15. Findings of the study of some variables of the decision to get vaccinated with some demographic variables – income levels

Statements	Vaccination Doses -	Less than 4000	4000-	8000-	15000-	40000+	Chi-squared (d.f)	Level of Significance
Conviction about the feasibility and importance of vaccination	No	17	10	13	11	11	3.715	0.446
	%	29.8	27.8	43.3	35.5	23.9	(4)	(Non-Significant)
	Yes	40	26	17	20	35		
	%	70.2	72.2	56.7	64.5	76.1		
Access to vaccination	No	6	-	6	2	8	9.519	0.049
	%	10.5	-	20.0	6.5	17.4	(4)	(Significant at
	Yes	51	36	24	29	38		0.05 level)
	%	89.5	100	80.0	93.5	82.6		
Number of doses received	First	6	-	2	2	-	23.989	0.002
	%	11.8	-	8.3	6.9	-	(8)	(Significant at
	1st, and 2nd Doses	39	29	18	25	22		0.01 level)
	%	76.5	80.6	75.0	86.2	57.9		
	3rd Dose	6	7	4	2	16		
	%	11.8	19.4	16.7	6.9	42.1		
The extent of pain during and after vaccination:								
- I felt pain and illness after every dose.	Numbers	17	17	15	15	34	36.453	0.000
	%	29.8	47.2	50.0	48.4	73.9	(8)	(Significant at
- I did not feel pain and illness after every dose.	Numbers	26	19	11	8	12		0.01 level)
	%	45.6	52.8	36.7	26.8	26.1		
- I felt pain and illness only after the first dose.	Numbers	14	-	4	8	-		
	%	24.6	-	13.3	25.8	-		
The extent of expenditure on personal protection means								
- from 5% -	Numbers	27	16	5	15	19	8.613	0.293
	%	52.9	44.4	20.8	51.7	50.0	(8)	(Non-Significant)
- from 10% -	Numbers	17	12	14	10	15		
	%	33.3	33.3	58.3	34.5	39.5		
- 20% or more	Numbers	7	8	5	4	4		
	%	13.7	22.2	20.8	13.8	10.5		

Table 16-a. The relationship between some of the demographic variables of the research sample and the timing of infection with the virus

Serial Number	Some demographic variables of the study	Infection of the individual or one of his family members			Timing of Infection		
		The value of Chi-squared test	Degrees of freedom	Level of Significance	The value of Chi-squared test	Degrees of freedom	Level of Significance
1	Gender	3.757	3	0.289 (Non-Significant)	4.183	4	0.382 (Non-Significant)
2	Nature of work - dealing with the public.	8.262	3	0.041 (Significant at 0.05 level)	6.715	4	0.152 (Non-Significant)
3	Support a family	2.063	3	0.559 (Non-Significant)	2.251	4	0.690 (Non-Significant)
4	Education Level	15.805	9	0.071 (Non-Significant)	14.090	12	0.295 (Non-Significant)
5	Income Level	7.339	12	0.834 (Non-Significant)	22.561	16	0.126 (Non-Significant)

Table 16-b. the Freq. and percentage distribution of the infection at the level of the family with the work nature of the head of the family

Dealing with the Public Infection	Dealing with the Public exists		Dealing with the Public does not exist	
Item	Numbers	%	Numbers	%
Wife/Husband	22	30.6	11	19.0
One of the children	21	29.2	11	19.0
Both of them	5	6.9	12	20.7
All family members	24	33.3	24	41.4

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