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Financial, Socioeconomic, and Psychological Problems of Stock Market Workers and Medical Health Workers during the COVID-19 Pandemic

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Abstract: This study aims to investigate the effect of Financial, Social, and Psychological Problems during the disease 2019 (COVID-19) and the expectation of its impact in the future on the effects of life for workers in the health sector and Egyptian Stock Market sector. The research method used a quantitative method with resort to an ordinal logit regression model to assess the impact of fear from COVID-19 for job losses and future expectations toward COVID-19 influence on the lives of workers in terms of economic, social, and psychological aspects assess The results show the health workers were more affected by the COVID-19 pandemic regarding decreased net income, increased work hours, and children's problems relative to the business workers .Regarding the socioeconomic level, the health workers had high percentages in the high class (16.9%) relative to the business workers (13.1%).In contrast, the business workers had high percentages in the low class (19%) relative to the health workers (25%).In addition, according to beck's scales, the health workers had relatively higher levels of anxiety than another sector, while the level of depression was similar in both sectors. We conclude Health workers were negative affected by the COVID-19 pandemic more than business workers regarding psychological (anxiety), financial and social problems. The type of work sector plays a prominent role in determining the effects of COVID-19 on all aspects of employee life.

Keywords: COVID-19; coronavirus; Egyptian Stock Exchange; health care workers; stock market workers; Egypt

1. Introduction

Since 2020, Covid-19 has had a significant impact on businesses and financial institutions. Even those who have not suffered any health consequences are still dealing with financial problems that arose as a result of the virus's outbreak. The COVID-19 pandemic has adversely impacted health care, financial services, the environment, transport, and other sectors [1,11]. Mostly, these adversely

impacted are caused by quarantine policies [1,2]. The global effect of COVID-19 has financial and social challenges on individuals, especially health care workers and the stock market workers [3,4,5]

Researchers wrote literatures that examine of the potential direct or indirect effects of COVID-19 on financial markets and institution [7]. The general population and health care workers' financial and psychological problems were evaluated on an individual level [8]. However, no research was conducted to assess the financial and psychological effects on stock market employees. As a result, we aimed to compare and evaluate the fear and expectation of COVID-19 on the financial, socioeconomic, and psychological burden on health care workers and stock market workers in Egypt.

2. Material and methods

2.1. Sample construction

This study was conducted using a descriptive cross-sectional survey design. Sample data (1,367) are collected from Egypt's health and business sectors. The population of the sample is determined by all the workers in governmental hospitals and workers in the Egyptian Stock Exchange. In the present study, a stratified random sample design is used, where each sector represents a unique stratum. The frame using in selecting the health sector sample is obtained from Central agency for Public Mobilization and statistics [9]. According to the Egyptian Stock Exchange, it includes 30 enterprises with 188,567 workers who represent the business population of the study. All enterprises in the EGX30 index are represented in the sample with a random sample of workers (n = 895) in each enterprise asked to answer the study questionnaire. For the health sector sample, there are some difficulties in including all governments because of precautionary measures applied in Egypt; therefore, we restrict the study to five governments that include the largest number of government hospitals, namely, big Cairo governments (Cairo,Giza,Kalyubia, Assuit, and Menia). These governments include 237 hospitals (35% of all government hospitals) with 92,868 workers. A random sample (n = 472) of workers in each hospital are asked to participate in the study according to the proportion of workers in each hospital, from which the health sector sample design is stratified into a clustered multistage sample.

The sample size for each sector is calculated using the formula:

$$n_0 = \frac{z^2 p(1-p)N}{z^2 p(1-p) + N e^2}$$

Applying the above formula with 95% confidence interval and .045 margin of error yields a sample size of 818 for the business sector and 472 for the health sector. The actual sample includes 895 from the business sector and 472 from the health sector with a total of 1367 participants.

2.1.1. *Measures:*

The selected participants are contacted to fill a questionnaire sent using their home mails and resend it again. To evaluate the proposed model, two parts of self-administered questionnaires. The first part of questionnaires was three validated questionnaires. First one is the socioeconomic scale was in Arabic and comprises four dimensions: level of education, employment, total family monthly income, and lifestyle of the family [10]. The second one is Beck anxiety inventory (BAI). It is a multiple-choice self-reported inventory for measuring the severity of anxiety. The scale comprises 21 items. Each item is scored on a scale of 0 (Not at All) to 3 (Severely). The total score ranges 0–63, where 0–7 is considered normal, 8–15 indicates mild anxiety, 16–25 indicates moderate anxiety, and 26–63 indicates severe anxiety (Beck et al., 1988). Beck Depression Inventory-II. It is used to measuring the severity of depression. After summing the score of each item, the total score is obtained. The 21-item version has scores that range from 0 to 63. Scoring of 0–13 does not indicate the presence of depression, 14–19 indicates mild depression, 20–28 indicates moderate depression, and 29–63 indicates severe depression (Beck et al., 1996).

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The second part was specific selected questions for evaluate demographic data; concerns and expectation; and Financial, economic, and social burden of COVID-19. The demographic variables are included: sex, age, residence, marital status, educational level, and the number of children. While Concerns and expectation of COVID-19 on individual income and finance are included question for "score your fear from COVID-19" and "score your expectation toward COVID-19.".Lastly,Financial ,economic, and social burden of COVID-19:It included questions about the impact of COVID-19 on participants' lives such as social life regarding children alongside marital and family problems. The financial and economic burden was also assessed such as the change in net income, personal bills, and work hours.

3. Result and discussion.

3.1. Demographic data and socioeconomic scale

According to the sample results in Table 1, there were 895 business sector workers and 472 health sector workers. There was a significant difference regarding age groups, marital status, and socioeconomic level. Regarding age, the health sector workers were 31–35 years old, whereas 36–40 years was the highest percentage for the business sector workers (30.9% and 26.7% vs. 32% and 18.8%). Conversely, age groups 26–30 and 31–35 years were the high percentages in the business sector workers relative to the health sector workers (28.8% and 32% vs. 23.7% and 30.9%). The high percentages of participants in both sectors were with children 57.6% (health) and 54.4% (business). The low percentages of participants in both groups were from rural. The health sector workers had high percentages in high class (16.9%) relative to the business sector workers (13.1%), whereas the business sector workers had high percentages in low class (19%) relative to the health sector workers (25%). This is due to high job income to health employee participants.

Table 1. Demographic features and socioeconomic scale of the included participants.

Item	business sector (n=895) (n,%)	Health sector (n=472) (n,%)	P- value
Sex:			
Males:	169(18.9)	64(13.6)	0.007*
Females:	726(81.1)	408(86.4)	
Age:		8(%1.7)	
18- 20 years	10(%1.1)		0.26
20-25 years	104(%11.6)	40(%8.5)	.04*
26-30 years	258(%28.8)	112(%23.7)	.02*
31-35 years	286(%32.)	146(%30.9)	.37
36-40 years	168(%18.8)	126(%26.7)	P<0.000*
41-45 years	34(%3.8)	24(%5.1)	.16
46+ years	35(%3.9)	16(%3.4)	.37
Residence:			
Rural	140(%15.6)	88(%18.6	0.09

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Urban	755(%84.4)	384(%81.4)	
Marital Status: Single	343(%38.3)	178(%37.7))	.43
Married	516(%57.7)	280(%59.3)	.29
Divorced	19(%2.1)	4(%.8)	0.06
Widow	17(%1.9)	10(%2.1)	.46
Having children			
No children	408(%45.6)	200(%42.4)	.14
Have children	487(%54.4)	272(%57.6)	
Socioeconomic class: Low class	170(%19)	118(%25)	.006
Middle class	608(%67.9)	274(%58.1)	P<0.000*
High class	117(%13.1)	80(%16.9)	.03

* Significant P value

3.2. Model setup

In this study, we resort to an ordinal logit regression model to assess the impact of fear from COVID-19 for job losses and future expectations toward COVID-19 influence on the lives of workers in terms of economic, social, and psychological aspects. This suits the ordinal nature of the study outcomes and permits comparison by different groups using the odds ratio. All the analyses are conducted using SPSS V.26.

The explanatory variables are mainly the degree of fear from COVID-19 for job losses, expectation toward COVID-19, and work sector besides controlling the effect of the demographic variables if found to exist. Moreover, the possible interaction between the work sector and other independent variables is investigated if found to be statistically significant. The following table (2) presents the independent variables included in the models according to the type of work sector. There is a similar pattern in categories of fear in both sectors although the business sector workers are statistically greater than their counterpart in the “afraid to moderate” degree category, whereas the health sector workers are much greater in the “not afraid” category. Health sector workers surpass the business sector workers in “better outcome” and “worse outcome” categories in expectation.

Table 2. independent variables values and characteristics.

variable	Label	Type	values	Business sector (n=895) (n,%)	Health sector (n=472) (n,%)	P value
fear from COVID-19	fear	ordinal	“1” not afraid	76(%8.5)	57(%12.1)	.02*
			“2” Afraid to little degree	225(%25.1)	127(%26.9)	.26
				384(%42.9)		.001

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			"3" Afraid to moderate degree "4" Very afraid	210(%23.5)	159(%33.7) 129(%27.3)	.06
expectation toward COVID-19	expectation	ordinal	"1" better outcome "2"no effect "3" worse outcome	170(%19) 608(%67.9) 117(%13.1)	118(%25) 274(%58.1) 80(%16.9)	.006* .0001* .03*
Work sector	Work sector	binary	"0" business sector "1" health sector			

The outcomes can be classified into three main categories: outcomes related to the economic and financial aspects of workers, outcomes reflecting the social impact of COVID-19 on workers' lives, and outcomes entailing the level of depression and anxiety. The following table (3) summarize all the dependent variables used in the analysis.

Table 3. dependent variables values and characteristics.

variable	label	type	Values
Effect of Covid-19 on workers' net income	Net income	ordinal	"-1" increase effect "0" no effect "1" decrease effect
Effect of Covid-19 on workers' personal bills	bills	ordinal	"1" increase effect "0" no effect "-1" decrease effect
Effect of Covid-19 on workers' work	Work hours	ordinal	"-1" decrease work hours. "0" no effect "1" increase work hours
Social burdens	Social burdens	count	"-1" improve. "0"no effect "1" mild effect "2" moderate effect "3" sever effect
beck depression inventory		ordinal	"1" Normal "2" mild "3" moderate "4" severe "5" very severe
beck anxiety inventory		ordinal	

For the variables measuring financial effects, three variables measuring the effect of COVID-19 on net income, personal bills, and work are being used. The respondent is required to evaluate the effect of COVID-19 on the three previous elements as "no effect," "decreasing effect," and "increasing

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effect." All answers are coded such that answers reflecting suffering or bad effect are +1, whereas the answers related to less suffering are −1 and no effect are 0.

The following charts present the distribution of the business and health sector workers according to the financial impact of COVID-19 on workers.

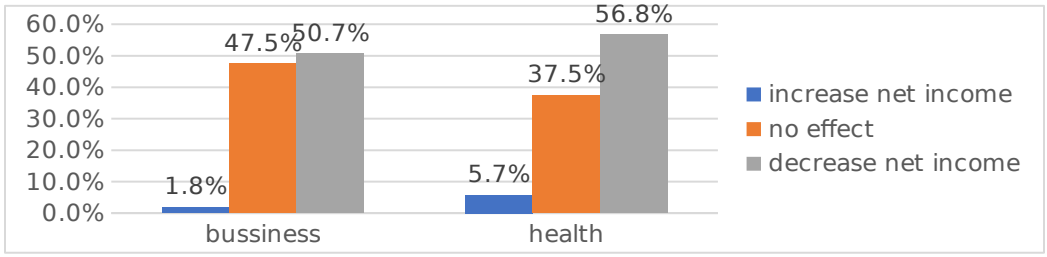

Figure 1. the distribution of the business and health workers according to the impact of Covid-19 on net income

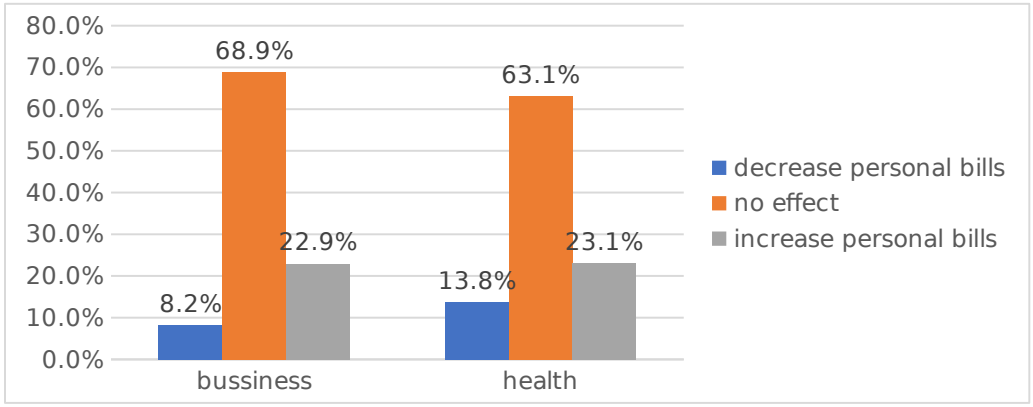

Figure 2. the distribution of the business and health workers according to the impact of Covid-19 on personal bills

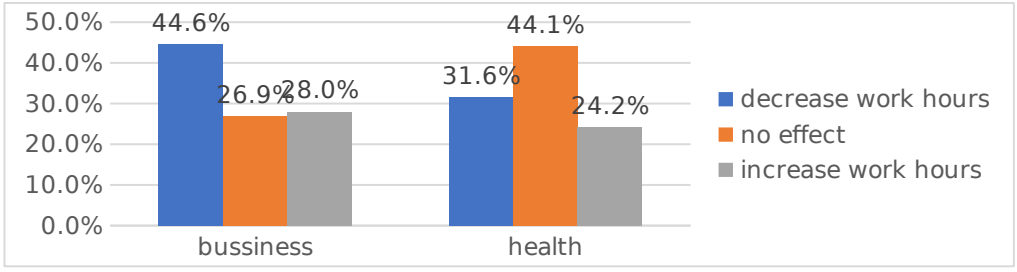

Figure 3. the distribution of the business and health workers according to the impact of Covid-19 on work hours

According to the above, a decreasing net income is the largest difference between the business and health sector workers.

The second category of the dependent variables includes two questions reflecting the impact of COVID-19 on the social aspects of the workers. The first variable (social burdens) is an artificial indicator generated from questioning the respondents directly about the effect of COVID-19 on their social life. Four responses are available of which three responses reflect suffering whereas the last reflects improving social life. The generated question (social burdens) gives one positive rank for each

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response of the first three responses related to suffering. For the last response, the response takes a negative value for decreasing the suffering because of COVID-19. This study aims to express increasing values of social burdens as an increase in suffering due to COVID-19 and vice versa. The following plot presents the prevalence of ranks for workers in both sectors. In the following figure (4), the ranks of the sample are plotted against the percentage of each rank in both sectors. The left-hand side of the figure represents low ranks presented by low ranks of suffering. The right side shows high ranks that induce more suffering. There is no big difference between sectors. Most of the samples fall after the beginning of the line indicating that most of the samples have a relatively small rank in social burdens.

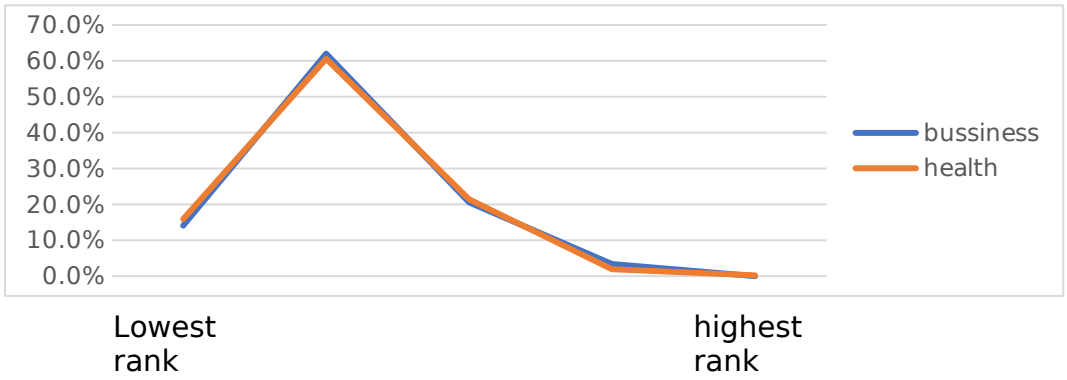

Figure 4. the prevalence of ranks for workers in both sectors.

The last category of the outcomes entails two variables measuring depression and anxiety levels of the workers using the Beck scales. The levels of depression and anxiety are plotted from the lowest level to the highest against the prevalence in the sample. The left-hand side of the figure represents low levels, while the right-hand side shows high ranks. According to the figures (5) and (6), the health sector workers have relatively higher levels of anxiety, whereas no pattern appears for depression levels.

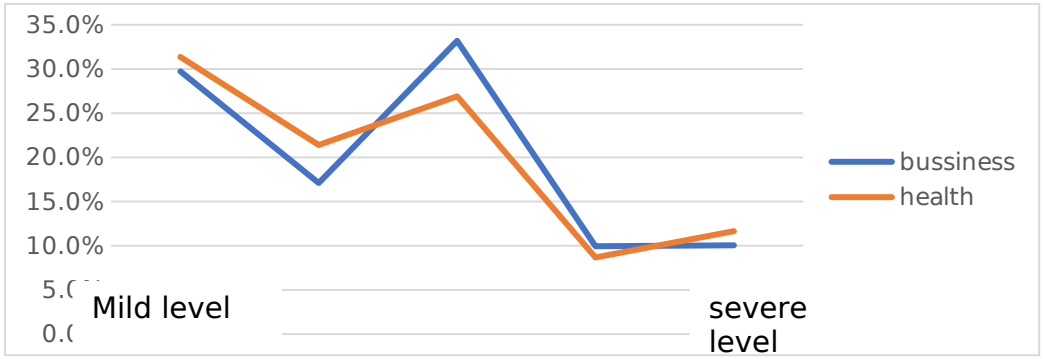

Figure 5. the distribution of the business and health workers according to levels of anxiety levels

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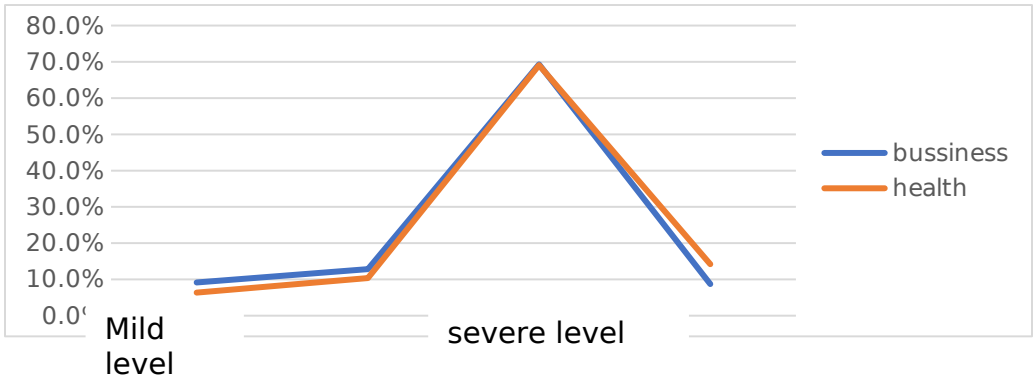

Figure 6. the distribution of the business and health workers according to levels of depression levels

3.3. Measuring the effect of fear and expectation on COVID-19 impact.

3.3.1. Studying the effect of fear and expectation on economic and financial life aspects of workers in business and health sectors.

Based on the above setup, we can utilize ordinal logit regression models to measure fear from COVID-19 (fear) and expectation toward COVID-19 (expectation) on the possible economic and financial life and whether this varies according to the work sector. Three ordinal regression models are constructed considering the degree of individual influence by COVID-19 to income, bills, and work hours as dependent variables. The independent variables are fear, expectation, work sector, and the interaction between work sector and other factors. The demographic variables are all insignificant when not enrolled in the models. The model's equations take the form:

$$\ln\left(net_{income}¿\right)=\beta_{0\,j_1}+\beta_{11}\,fear+\beta_{12}\,Epectation+\beta_{13}\,work\ sector+\beta_{14}\,fear*work\ sector++\beta_{15}\,Epectation*work\ s$$

$$\ln\left(personal\ bills¿\right)=\beta_{0\,j_2}+\beta_{21}\,fear+\beta_{22}\,Epectation+\beta_{23}\,work\ sector+\beta_{24}\,fear*work\ sector++\beta_{25}\,Epectation*$$

$$\ln\left(work¿hours\right)=\beta_{0\,j_3}+\beta_{31}\,fear+\beta_{32}\,Epectation+\beta_{33}\,work\ sector+\beta_{34}\,fear*work\ sector++\beta_{35}\,Epectation*wo$$

where $\beta_{i1},\beta_{i2},\beta_{i3},\beta_{i4}\wedge\beta_{i5}$ are model slope parameters for $i=1,\ldots,3$. β_{0j_i} are the thresholds for each model that play the role of constants in the ordinal regression model. Finally, ε_i are the error terms of the models.

Ordinal logit regression models fall under generalized linear models which are of importance when outcomes do not have a continuity nature but only an ordinal scale. The general structure of the generalized linear model takes the form:

$$E\left(Y\middle|X\right)=g^{-1}(X\beta),$$

where $E\left(Y\middle|X\right)$ is the conditional expectation of the outcome, g is the link function that relates the independent variable Y to the explanatory variables (X) through the vector of model parameters β.

The following sections highlight the main aspects of the model results and their interpretation.

3.3.1.1. Net income

The results of the first model indicate that fear and work sector tend to influence the degree of negative effects related to net income. Moreover, there is an interaction between both fear and expectation alongside work sector. Using the typical interpretation of the odds ratio (EXP (β)) and the significance levels, we can conclude the following:

The odds of exposure to negative effects (which are represented by high scores according to the coding of net income) in net income for people choosing "not afraid" is only .39 the odds of exposure to negative effects in net income for people choosing "very afraid." Alternatively, we can say that the odds of exposure to negative effects in net income for workers choosing "very afraid" is 2.56 (1/.39)

times the odds of exposure to negative effects in net income for workers choosing “not afraid.” Since higher scores in income indicate more suffering, increasing fear tends to increase the negative effects of COVID-19 on net income, i.e., decrease the net income.

The work sector has a significant effect on exposure to negative effects in net income. Since the reference category for the work sector is the health sector, the odds of exposure to negative effects in net income for workers is approximately four times its corresponding odds for workers in the business sector. This means that workers in the health sector tend to be affected by COVID-19 by decreasing their net income more than workers in the business sector.

There is an interaction between fear and work sector since the effect of fear is enlarged for the health sector workers. As presented in Table (4), the estimated coefficients of [fear = not afraid] * work sector = health and [fear = afraid to a little degree] * work sector = health are both significant. This means the odds of exposure to a decrease in net income for whom choosing “not afraid” is only .10, by exponentiating (−.95–1.3), the odds of exposure to a decrease in net income for whom choosing “very afraid” among the health sector workers. We calculate the effect of fear in the health sector by summing its main effect, which is the estimated coefficient of [fear = not afraid] (−.95), and its interaction effect with the work sector at health category (−1.3) and then exponentiating the sum (−2.25). This is because [fear = not afraid] has two significant effects: one for all workers and an additional one for only the health sector workers. Comparing this result with results of (1), we can conclude generally that the odds of exposure to negative effects in net income for workers in both sectors choosing “very afraid” is 2.56 (1/.39) times the odds of exposure to negative effects in net income for workers choosing “not afraid.” However, for the health sector workers only, the odds of exposure to negative effects in net income for workers choosing “very afraid” is 10 (1/2.25) times the odds of exposure to negative effects in net income for workers choosing “not afraid.”
Moreover, among only the health sector workers, the odds of exposure to a decrease in net income for workers choosing “afraid to a little degree” is only .23 times the odds of exposure to a decrease in net income for workers choosing “very afraid.”

Although there is no net effect for expectation on net income, it has a significant effect on only the health sector workers. The odds of exposure to a decrease in net income for health sector workers expecting “a better future” effect on income is only .43 times the odds of exposure to a decrease in net income for the workers expecting “a worse future” effect on income.

Table 4. Regression between Net income and fear, expectation, and work sector

Variable	estimate	Wald	P-value	Odds ratio (EXP (β))	95% confidence interval
Fear =not afraid	-0.95	8.62	0.001	0.39	0.20-0.73
Fear = Afraid to little degree	0.22	0.87	0.35	1.24	0.79-1.96
Fear = Afraid to moderate degree	0.00	0.20	0.99	1.00	0.67-1.49
expectation= better	0.32	0.22	0.14	1.38	0.90-2.13
expectation = no effect	0.02	0.19	0.93	1.02	0.71-1.46
Work sector =health sector	1.33	0.38	0.001	3.77	1.79-7.97
[Fear =not afraid] * work sector=health sector	-1.30	0.53	0.01	0.27	0.10-0.78
[Fear = Afraid to little degree] * work sector	-1.49	0.42	0.001	0.23	0.10-0.51

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=health sector					
[Fear = Afraid to moderate degree] * Work sector =health sector	-0.63	0.39	0.11	0.53	0.25-1.14
[expectation= better] * Work sector =health sector	-0.84	0.41	0.04	0.43	0.19-0.97
[expectation= No effect] * Work sector=health sector	-0.45	0.35	0.19	0.64	0.32-1.26

- Reference category for fear is very afraid.
- Reference category for expectation is worse.
- Reference category for work sector is business.
- Chi-square statistic for model significance is 52.72 with P-value less than .0001.

3.3.1.2. Personal Bills

The second model entails regressing the same previous independent variables on the impact of COVID-19 on personal bills (bills). The results of model (2) presented in Table (5) show that although there is no net effect for all variables on bills, there are two significant interactions between the work sector and both fear and expectation. Among only the health sector workers, the odds of exposure to an increase in bill values as a result of COVID-19 for whom are "afraid to a moderate degree" is .47 times its corresponding odds for workers that are "very afraid" of COVID-19. Additionally, the odds of exposure to an increase in bill values as a result of COVID-19 for those expecting "a better future" is .48 times its corresponding odds for health sector workers that expect "a worse future." The main conclusion is that both fear and expectation have negative effects on bills for the health sector workers only.

Table 5. Regressing between personal bills (bills) and fear, expectation, and work sector.

variable	estimate	Wald	P-value	Odds ratio (EXP(β))	95% confidence interval
Fear =not afraid	0.21	0.57	0.45	1.24	0.71 - 2.14
Fear = Afraid to little degree	-0.30	2.17	0.14	0.74	0.49 - 1.11
Fear = Afraid to moderate degree	0.29	2.52	0.11	1.34	0.93 - 1.92
expectation= better	0.02	0.01	0.91	1.02	0.71 - 1.48
expectation = no effect	0.16	0.97	0.32	1.17	0.85 - 1.61
Work sector =health sector	0.43	1.99	0.16	1.53	0.85 - 2.76
[Fear =not afraid] * work sector=health sector	-0.12	0.07	0.79	0.89	0.37 - 2.13
[Fear = Afraid to little degree] * work sector	-0.33	0.94	0.33	0.72	0.37 - 1.40

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=health sector					
[Fear = Afraid to moderate degree] * Work sector =health sector	-0.75	5.72	0.02	0.47	0.26 - 0.87
[expectation= better] * Work sector = health sector	-0.73	4.99	0.03	0.48	0.25 - 0.91
[expectation= No effect] * Work sector=health sector	-0.28	1.02	0.31	0.75	0.43 - 1.31

- Reference category for fear is very afraid.
- Reference category for future expectation is worse.
- Reference category for work sector is business.
- Chi-square statistic for model significance is 30.02 with P-value .03.

3.3.1.3. Work hours

Table (6) presents the results of regressing the impact of COVID-19 on work hours using the same independent variables in previous models. According to the results, workers that are "afraid to moderate degrees" tend to have less extra work hours effect as a result of COVID-19 than their counterparts that are "very afraid." The odds of having an increase in work hours because of COVID-19 for workers "afraid to a moderate" degree is .69 times the odds of having an increase in work hours for workers "very afraid."

Additionally, the type of work sector seems to affect COVID-19 impact on work hours significantly. That is, the health sector workers tend to have extra work hours as a result of COVID-19 than do the business sector workers. Since the odds ratio of the work sector is 1.76, we can conclude that the odds of having an increase in work hours because of COVID-19 for the health sector workers is 1.76 times the odds of having an increase in work hours for the business sector workers. The interaction terms are all non-insignificant.

Table 6. Regressing between work hours and fear, expectation, and work sector.

variable	estimate	Wald	P-value	Odds ratio (EXP(β))	95% confidence interval
Fear =not afraid	-0.37	1.76	0.18	0.69	0.40 - 1.19
Fear = Afraid to little degree	0.10	0.25	0.62	1.10	0.76 - 1.60
Fear = Afraid to moderate degree	-0.38	4.66	0.03	0.69	0.49 - 0.97
expectation= better	-0.11	0.36	0.55	0.89	0.62 - 1.29
expectation = no effect	0.15	0.94	0.33	1.16	0.86 - 1.57
Work sector =health sector	0.56	4.04	0.04	1.76	1.01 - 3.04
[Fear =not afraid] * work sector=health sector	-0.45	1.11	0.29	0.64	0.28 - 1.47
[Fear = Afraid to little	-0.46	2.16	0.14	0.63	0.34 - 1.17

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degree] * work sector = health sector					
[Fear = Afraid to moderate degree] * Work sector =health sector	0.23	0.64	0.42	1.26	0.72 - 2.22
[expectation= better] * Work sector =health sector	-0.19	0.38	0.54	0.83	0.46 - 1.50
[expectation= No effect] * Work sector=health sector	-0.51	3.92	0.05	0.60	0.36 - 0.99

- Reference category for fear is very afraid.
- Reference category for expectation is worse.
- Reference category for work sector is business.
- Chi-square statistic for model significance is 27.02 with P-value .004.

3.3.2.Studying the effect of fear and expectation on social life aspects of workers in business and health sectors.

In this part, fear and expectation are being investigated for their possible effect on COVID-19 impact on the social life of workers in both sectors measured by social burden controlled for significant demographic variables.

The model equation takes the form.

$$\ln\left(Social\,burden¿\right)=\beta_{0\,j_1}+\beta_{11}\,fear+\beta_{12}\,Epectation+\beta_{13}\,work\,sector+\beta_{14}\,fear*work\,sector++\beta_{15}\,Epectation*$$

The results indicate that there is no significant main effect for any variable except for the socioeconomic class. The interaction term between health and expectation is significant. The conclusion is that expectation affects COVID-19 social impact for only health sector workers. According to the odds ratio value of [expectation = no effect] * [work sector = health], the odds of getting high social burdens for health sector workers expecting “no effect” for COVID-19 in the future is .52 times the odds of getting the same high social burdens for workers expecting “a worse effect.”

Additionally, there is a statistically significant effect for the socioeconomic levels on the degree of COVID-19 social impact. The odds of exposure to high levels of social suffering measured by social burdens for workers at a low level is 1.95 times the odds of exposure to the same high levels of social suffering for workers at the high socioeconomic level. Other variables fail to achieve any statistical effect.

Table 7. Regression between social burden and fear, expectation and work sectors

variable	estimate	Wald	P-value	Odds ratio (EXP(β))	95% confidence interval
Fear =not afraid	-0.37	1.76	0.18	0.69	0.40 - 1.19
Fear = Afraid to little degree	0.10	0.25	0.62	1.10	0.76 - 1.60
Fear = Afraid to moderate degree	-0.38	4.66	0.03	0.69	0.49 - 0.97
expectation= better	-0.11	0.36	0.55	0.89	0.62 - 1.29
expectation =	0.15	0.94	0.33	1.16	0.86 - 1.57

no effect					
Work sector =health sector	0.56	4.04	0.04	1.76	1.01 - 3.04
[Fear =not afraid] * work sector=health sector	-0.45	1.11	0.29	0.64	0.28 - 1.47
[Fear = Afraid to little degree] * work sector = health sector	-0.46	2.16	0.14	0.63	0.34 - 1.17
[Fear = Afraid to moderate degree] * Work sector =health sector	0.23	0.64	0.42	1.26	0.72 - 2.22
[expectation= better] * Work sector =health sector	-0.19	0.38	0.54	0.83	0.46 - 1.50
[expectation= No effect] * Work sector=health sector	-0.51	3.92	0.05	0.60	0.36 - 0.99

- Reference category for fear is very afraid.
- Reference category for expectation is worse.
- Reference category for work sector is business.
- Chi-square statistic for model significance is 27.02 with P-value .004

3.3.3.Studying the effect of fear and expectation on the psychological aspects of the employee.
Two regression models are constructed treating the Beck depression and anxiety levels as outcomes. The explanatory variables are fear, expectation, and work sector after controlling for the demographic variables. No interaction terms are included as they are all insignificant. The model forms can be expressed as

$$\ln(Beck\ depression¿) = \beta_{0j_1} + \beta_{11} fear + \beta_{12} Epectation + \beta_{13} work\ sector + \beta\, residence + \varepsilon_1 ,¿$$

$$\ln(Beck\ anxiety¿) = \beta_{0j_2} + \beta_{21} fear + \beta_{22} Epectation + \beta_{23} work\ sector + \beta\, residence + \varepsilon_2 .¿$$

For the first model where the Beck depression level is the outcome, neither demographic aspect are significant except the residence place, hence dropping all other demographic variables. The results shown in Table (8) reveals none of the explanatory variables statistically affect the Beck depression except the residence place; workers living in rural areas tend to have a lower degree in the Beck depression than do workers in urban areas. The odds of having higher levels in the Beck depression scale for rural workers is .73 times its corresponding odds for those in urban areas. Fear, future expectation, and work sector seem to not affect the Beck depression levels.

Table 8. Regressing between the Beck depression levels and fear, expectation, socioeconomic class, and work sector.

Variable	estimate	Wald	P-value	Odds ratio (EXP(β))	95% confidence interval
Fear =not afraid	0.30	1.26	0.26	1.35	.8 - 2.27
Fear = Afraid to little degree	-0.27	1.85	0.17	0.77	.52 - 1.12

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Fear = Afraid to moderate degree	-0.15	0.75	0.39	0.86	.61 - 1.21
expectation= better	-0.02	0.02	0.90	0.98	.69 - 1.39
expectation = no effect	-0.14	0.86	0.35	0.87	.64 - 1.17
Work sector =health sector	0.27	0.91	0.34	1.31	.75 - 2.3
socio-economic class=low	0.67	12.74	0.00	1.95	1.35 - 2.81
socio-economic class= Middle	0.20	1.55	0.21	1.22	.89 - 1.67
[Fear =not afraid] * work sector=health sector	-0.74	2.98	0.08	0.48	.21 - 1.11
[Fear = Afraid to little degree]* work sector =health sector	0.43	1.77	0.18	1.53	.82 - 2.87
[Fear = Afraid to moderate degree]* Work sector =health sector	-0.34	1.31	0.25	0.71	.4 - 1.27
[expectation= better] * Work sector = health sector	-0.25	0.68	0.41	0.78	.42 - 1.42
[expectation= No effect] * [Work sector=health]	-0.65	5.84	0.02	0.52	.31 - .89

- Reference category for fear is very afraid.
- Reference category for future expectation is worse.
- Reference category for work sector is business.
- Reference category for socio-economic class is high.
- Chi-square statistic for model significance is 27.00 with P-value .005

The second model of regressing the Beck anxiety levels on the same previous explanatory variables shows a different result. Residence maintains its statistical effect but also is a significant effect for work sector. As shown in Table (9), the odds ratio of work sector is 1.56, meaning that the odds of getting a high level in the Beck anxiety for the health sector workers is 1.56 compared with that for the business sector workers. Additionally, the odds of getting a high level for rural residents is only .61 times its corresponding odds for urban workers.

Table 9. Regressing between the Beck anxiety levels and fear, expectation, socioeconomic class, and work sector.

Variable	estimate	Wald	P-value	Odds ratio (EXP(β))	95% confidence interval
Fear =not afraid	0.30	1.26	0.26	1.35	.8 - 2.27

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Fear = Afraid to little degree	-0.27	1.85	0.17	0.77	.52 - 1.12
Fear = Afraid to moderate degree	-0.15	0.75	0.39	0.86	.61 - 1.21
expectation= better	-0.02	0.02	0.90	0.98	.69 - 1.39
expectation = no effect	-0.14	0.86	0.35	0.87	.64 - 1.17
Work sector =health sector	0.27	0.91	0.34	1.31	.75 - 2.3
socio-economic class=low	0.67	12.74	0.00	1.95	1.35 - 2.81
socio-economic class= Middle	0.20	1.55	0.21	1.22	.89 - 1.67
[Fear =not afraid] * work sector=health sector	-0.74	2.98	0.08	0.48	.21 - 1.11
[Fear = Afraid to little degree] * work sector =health sector	0.43	1.77	0.18	1.53	.82 - 2.87
[Fear = Afraid to moderate degree] * Work sector =health sector	-0.34	1.31	0.25	0.71	.4 - 1.27
[expectation= better] * Work sector = health sector	-0.25	0.68	0.41	0.78	.42 - 1.42
[expectation= No effect] * [Work sector=health]	-0.65	5.84	0.02	0.52	.31 - .89

- Reference category for fear is very afraid.
- Reference category for future expectation is worse.
- Reference category for work sector is business.
- Reference category for socio-economic class is high.
- Chi-square statistic for model significance is 27.00 with P-value .005.

4. Conclusion:

In conclusion, COVID-19 is not only disease that affected health aspect but also disease that had negative impact on different aspects of life. It causes impairment in all socioeconomic aspects of individual especially health care workers who have children. Also, health care worker have higher levels of anxiety than stock market sector but both sectors equal in depression level. The work sector is proven to have direct and indirect effects on the degree of suffering related to the outcomes of the study as it mediates fear for job losses and expectation on study outcomes. COVID-19 negatively impacts net income and work hours for workers in both sectors. It influences COVID-19 effects on personal bills for the health sector workers only. For social outcomes, future expectations only affect the degree of social burdens for health sector workers.

Table 10. Summarizes all the study findings.

Independent variables	Dependent variable	Type of effect
Work sector	Net income	Direct and indirect

	Personal bills	Indirect
	Work hours	Direct
	Beck anxiety depression	Direct
fear	Net income	Direct and indirect
	Personal bills	Indirect
	Work hours	Direct
expectation	Net income	Indirect
	Personal bills	Indirect
	Social burden	Indirect

- Only significant effects are shown.

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