

How to Cite:

Hantira, N. Y. M., Abdelaziz, M. M., El Demerdash, D. A., & Ahmed, H. A. E. (2022). Impact of COVID-19 pandemic on health-related quality of life, personal resilience, and academic performance difficulties of recovered patients in Egypt: An online survey. *International Journal of Health Sciences*, 6(S5), 11783–11809. <https://doi.org/10.53730/ijhs.v6nS5.11082>

Impact of COVID-19 pandemic on health-related quality of life, personal resilience, and academic performance difficulties of recovered patients in Egypt: An online survey

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Abstract---Background: In early March 2020, the World Health Organization (WHO) declared Coronavirus disease-2019 (COVID-19) to be a global pandemic. This fatal disease may have a severe impact on quality of life, personal resilience, and academic performance. Aim of the study: To assess the impact of the COVID-19 pandemic on the health-related quality of life, resilience, and academic performance difficulties among recovered patients in Egypt. Study Design: A descriptive exploratory cross sectional research design was used. Study Settings: The current study was conducted among Egyptian subjects living in 27 governorates using an online survey method. Study Subjects: The study was carried out on a 405 Egyptian who were responded to the online questionnaire. Data collection tools: Health-Related Quality of Life, Personal Resilience and Academic Performance Difficulties among Recovered COVID – 19 Patients

Assessment Survey Questionnaire was used which include five main parts (part I, & II to assess sociodemographic data, and history and risk factors, part III to Health-Related Quality of Life, part IV to assess personal resilience, and part V to assess the academic performance). Results: COVID-19 infection among the participants was associated with many risk factors, including obesity, sedentary lifestyle, frequent consumption of vegetables and fruits, history of chronic diseases, such as diabetes and hypertension, and living with elderly or chronically ill family members. The health-related Quality of Life scores of recovered COVID-19 patients were low in the current study. Moreover, forty one percent of recovered patients had low scores on personal resilience. Furthermore, more than sixty percent (60.5%) of the studied subjects have major academic performance difficulties due to COVID-. Conclusion: A statistically significant negative correlation was found between the participants' resilience scores and their HRQoL scores, whereas there is a statistically significant weak positive correlation noted between the study subject's total academic performance difficulties scores and their health-related quality of life scores. With no correlation noted between the study subject's total resilience scores and their total academic performance difficulties score. Recommendations: Health education interventions aimed at improving lifestyles and enhancing immunity health of individuals to eliminate the risk factors associated with COVID-19 infection. Programs directed specifically at recovering COVID-19 patients, especially young adults, low-educated and low-income individuals, to improve their health-related quality of life, resilience and academic performance difficulties

Keywords---COVID-19, quality of life, resilience, academic performance, recovered patient.

Introduction

Currently, the world suffering from a novel Coronavirus Disease 19 (COVID-19) Outbreak. This disease is highly contagious and has quickly spread and become pandemic around the world. While there is no control on the situation and the pandemic accelerates globally, COVID-19 threatens millions of lives in the world. This poses a challenge to medical staffs, especially to front-line medical staffs, who are directly contacting with patients (Wu, & McGoogan. 2019). In Egypt, there are 132,541 cases, and 7,405 deaths, as it ranked the 154th in the number of cases and the eighth in the death's numbers in the world for each one million people (The Egyptian Ministry of Health and Population, 2020). Many precautionary measures have been taken by the Egyptian government to limit the spread of the virus like giving the state employees an exceptional leave for a period of 3 months, who are mothers of children till ten years, and those with chronic diseases who are more vulnerable to the infection than others, except the medical staff, they work until drop with no leaves (Bonsall, 2020).

Resilience is a dynamic process that involves constructive adaptation; it can be characterized as a measurable and modifiable mechanism involving people's awareness of their state or capacity of strength, which helps them deal with trying circumstances and make better use of the resources at hand (Lightsey, 2006); (Iacoviello & Charney, 2020). A substantial challenge, maintaining a meaningful and satisfying life, being actively involved in life, and having a good outlook on the present are all considered to be operationalized as resilience (Windle and Bennett, 2012; Donnellan et al., 2014).

In terms of mental health issues including post-traumatic stress disorder, depression, anxiety, and sleeplessness, COVID-19 is a serious illness that can have a substantial impact on how recovered patients and their families live their daily lives (Wang et al, 2020; & Tan et al, 2020). People are dealing with ongoing changes in their lives because of the epidemic, including disruptions to their health, career, and family life. (Wang et al, 2020; Tan et al., 2020). For many people, this buildup of various stressors may lead to an increase in psychological distress and a drop in emotions of well-being. The present COVID-19 epidemic may have a special effect on the risk and resilience factors that influence people's ability to cope with stress and adversity and maintain their mental health. (Simon et al., 2020)

One of the most crucial outcome metrics for patients is health-related quality of life (HRQoL). (Kalliopi, 2013). Physical functioning, psychological functioning, social support, social functioning, and demographic characteristics are all included in the multidimensional concept of HRQoL. (Cheng et al, 2004). The outbreak of an infectious virus tends to cause a variety of health and social problems. As well as the negative impact COVID-19 has on patients' quality of life (QoL). Since the patients are not immune to future infection, it may lead to a more negative impact on patients' QoL. Health-related quality of life (HRQoL) is an important measure that is used for assessing the impact of diseases, disorders, or disabilities on the physical, mental, and social domains of patient health. (Nguyen et al, 2020; & Metzger et al, 2020)

People with suspected COVID-19 symptoms had lower HRQoL than symptom-free people during the COVID-19 pandemic, according to the results of the first investigation on the quality of life of suspected COVID-19 patients (Nguyen et al., 2020), which focused on the relationship between health literacy and HRQoL. Studies on survivors' experiences, including their physical, psychological, and social problems, have become more prevalent but are still few as an increasing number of COVID-19 patients are released from medical care. For example, Zhao et al., (2020) reported radiological and physiological abnormalities in COVID-19 survivors three months after being discharged from the hospital. In the early stages of recovery, psychological discomfort was more common among COVID-19 survivors, according to Cai et al. (2020). Asare (2020) discovered that communities stigmatized survivors. These investigations focused on domains of COVID-19 survivors' quality of life.

COVID-19 pandemic has affected all levels of the education system Nicola et al, (2020). Educational institutions around the world have either temporarily closed or implemented localized closures affecting about 1.7 billion students worldwide

UNESCO. Education, (2020). Many universities around the world either postponed or canceled all campus activities to minimize gatherings and hence decrease the transmission of the virus. However, these measures lead to higher economical, medical, and social implications for both undergraduate and postgraduate communities (Esposito & Principi, 2020)

According to Winters and Patel (2021), the COVID-19 pandemic outbreak has had a severe impact on students' education globally, and universities need to modify their teaching and learning strategies. Day et al. (2021), added that the COVID-19 epidemic caused most students to experience stress, which had a detrimental effect on their academic performance. Additionally, they claimed that universities and testing facilities withheld exams that prevented students from enrolling in colleges and universities. Many teachers have cut back on the amount of instruction and practice, or the length of the online lecture which affects the quality of learning.

Significance of the study

COVID-19 is an epidemic that has swept the world and has much impact on the physical, psychological, educational, economic, and social state of individuals. Health-related quality of life (HRQoL) is an important measure that is used for assessing the impact of diseases, disorders, or disabilities on the physical, mental, and social domains of patient health. As well, resilience is critical factor for adaptation and maintenance of life after any disease, and disaster. So, the researchers decided to conduct this study.

Aims of the study

The current study aimed to assess the impact of the COVID-19 pandemic on the health-related quality of life, resilience, and academic performance difficulties among recovered patients in Egypt through the following objectives:

Specific objectives

1. Assess the health-related quality of life, resilience, and academic performance difficulties among COVID-19 recovered patients.
2. Identify the relationship between health-related quality of life, resilience, and academic performance difficulties with the sociodemographic characteristics of COVID-19 recovered patients.
3. Explore the correlation between the health-related quality of life, resilience, and academic performance difficulties among COVID-19 recovered patients.

Research Questions

1. What is the correlation between the health-related quality of life among recovered patients of COVID-19 with their resilience and academic performance?
2. Is there a relationship between health-related quality of life, resilience, and academic performance among recovered patients of COVID-19 with their sociodemographic characteristics?

Subjects and Method

Study Design: An online cross-sectional exploratory research design was used.

Study Setting: An online survey using Google form was sent to cover almost Egyptian governorates. Only 16 governorates were reached through the online form sent (Alexandria, Cairo, Giza, Albehyra, Monufia, Kafrel sheikh, Matrouh, Daqhlyia, Qalyubia, Gharbia, Fayoum, Ismailia, Asyut, Redsea, Minya, and Damietta).

Type of sample: A convenient sample was used.

Study Subjects

The study respondents were Egyptian residents with a minimum age of 18 years old. Using the Epi Info 7 program, a sample size of 405 was determined. The calculations used a 50.0 percent probability of personal resilience and health-related quality of life against the COVID-19 pandemic at a 95 percent confidence interval, precision of 5%, with a design effect of 1, and a calculated sample size of at least 384 respondents because there were concerns or no comparable studies regarding coronavirus disease. Accordingly, the survey portal was closed and stopped at the end of the day when the number of respondents exceeded the sample size and after a week of no response was sent or answered, i.e., at the end of June Sample technique: An online convenient sample was used because of the national partial lockdown and the difficulty to collect the required number of respondents due to social distance precautions during data collection duration. A Snowball sampling technique was used. A total of 405 respondents took part in the survey. Several strategies were used to reach as many participants as possible to cover most of the Egyptian governorate within a decided time of data collection as mentioned in the methods part.

Tools of the study

The questionnaire used was comprised of the following different Five parts: parts I, and II were developed by the researchers after reviewing recent and available literature. (Michie et al., (2011; CDC, WHO, 2020; West et al. 2020, and Giusti et al. 2021). The survey questionnaire was formulated in Arabic, the native language of Egypt.

Part1: Personal and Economic information; Participants' demographic characteristics, and their daily activities modification questionnaire: include (age, gender, education, occupation, marital status, governorate residence, place of living either rural or urban, number of living personnel in the same home, and number of youngest children age if present.

Part II: Patient history and risk factors before contracting the virus. Such as heart diseases, renal diseases, and immunity diseases.

Part III: EQ-5D-5L instrument: Mobility, self-care, regular activities, pain/discomfort, and anxiety/depression are the five aspects of the EQ-5D- 5L. To characterize all potential health states, each dimension provides 5 levels of answer possibilities (no difficulties, slight problems, moderate problems, severe problems, and unable to/extreme problems).

Part IV: Connor and Davidson resilience scale: (CD- RISC), consists of 25 items representing three dimensions: tenacity, strength, and optimism. It employs a 5-point Likert-type scale (0 = "never" to 4 = "almost always"). The total scores range from 0–100, and higher total scores indicate higher levels of resilience

Validity and Reliability of the tool

Test-retest reliability for parts I and II was established using the intra-class correlation coefficient and the Cronbach's Alpha coefficient test. The intraclass correlation coefficient was 0.91, and the internal consistency reliability result was 0.79.

Part III: adopted from The EuroQol Group (1990) (EQ-5D-5L) the instrument is one of the most used instruments for measuring HRQoL in clinical and outcome research. A correlation between the EQ-5D-5L and the WHO 5 dimensions ($r=.43$, $P<.001$) showed convergence validity. (2013) Janssen et al. The EuroQol method is trustworthy, with test-retest reliability utilizing interclass coefficients averaging 0.78 and 0.73 on average (Brooks, 1996).

Part IV: adopted from Connor and Davidson, (2007) resilience scale: (CD- RISC), The scale can effectively measure the resilience of the general population and clinical patients and has good reliability and validity. The reliability of the CD-RISC was 0.91, and Cronbach's alpha of the scale in this study was 0.959 (Yu & Zhang, 2007).

Part V: Academic performance difficulties due to COVID-19 assessment adopted from the survey instrument developed by Giusti et al (2021) that aimed to assess academic performance difficulties during the COVID-19 era. The survey contains 15 questions using a five-point Likert scale ranging from 0 (no difficulties) to 4 (major difficulties). the total scores were 60 points which transferred into the total percent score, where the lower mean percentage indicates minor difficulties. The scale was 89.7% reliable whereas Cronbach's alpha of the scale in this study was 0.897.

A pilot study

A pilot study was carried out on 26 respondents to test the extent of the clarity, feasibility, applicability, and average time required needed to be completed by each respondent. The necessary modifications were done. These responses were excluded from the total study subjects.

Methods

- An online semi-structured questionnaire was developed using Google forms. All response was sent to the researcher's mail and collected through Google form responses. A standardized general startup note describes for each participant the title, purpose, inclusion criteria of the research study, and acceptance of completing the survey and ensuring the anonymity and privacy of the data at the beginning of the online form also was noted with the link. The link of the questionnaire was sent through the different social

networks, media, and platforms especially (e-mails, Facebook, Twitter, LinkedIn, WhatsApp, and Instagram) which were used in disseminating the survey to for reaching out to many the communities as possible.

- Data was collected between the first of May till the end of June 2021.
- Respondents who gave consent to willingly contribute to the online survey following the 'next' button would then be directed to complete the self-administered questionnaire. After submission, there were thanks messages sent to each respondent. The study respondents were encouraged to distribute the questionnaire link to as many people as possible. Thus, the link was furthered to people away from the first respondents of contact in different Egyptian governorates and so on.
- Before sending the online form, a preliminary phase was conducted to assess the validity and reliability of the tool. Five experts in the field of community health nursing and nursing education were asked to review the questionnaire regarding its relevancy and content validation related to the aim of the study.
- An initial question was asked: Have you been infected with the Coronavirus? When answering yes, complete the questionnaire. The total number of the studied subjects is 405 members among them 334 are currently in education either undergraduate or postgraduate education.

Statistical analysis

The row data and participant responses were collected through goggle form into an excel sheet and then they were coded using to SPSS sheet. All data analyses were performed using Statistical Package for the Social Sciences (SPSS) software, version 22. Descriptive statistical methods were used to summarize data on demographic characteristics and responses to questions concerning participant behavior related to COVID-19. Data were summarized as frequencies (n) and percentages (%) for categorical variables. A value of $P < 0.05$ was considered statistically significant. Continuous variables were represented as arithmetic means $\bar{x}$, standard deviations $\pm$ SD. One Way ANOVA test: Parametric statistical tests were used to compare the means for quantitative data of HRQoL of each study participant and their demographic variables.

Ethical considerations

Written online consent after a complete description of the research purpose was included in the start-up statement at the beginning of the online form. Respondents who gave consent followed the 'next' button and would then be directed to complete the self-administered questionnaire. Confidentiality and anonymity of participants' responses were ensured by the statement on the startup page of the online tool, and a code number was used instead of the names as well. Participation was maintained on a voluntary basis.

Results

Table (1): More than half (50.9%) of the studied subjects were aged from 20 to less than 30 years, while the minorities of the studied subjects aged less than 20 years and less than 50 years (4% and 1.7% respectively). More than three-quarters

(78.5%) were females. Regarding the levels of education nearly half (45.4%) had a bachelor's degree, while (5.4%) had basic education. Furthermore, more than eighty percent (82.5%) are currently in education either undergraduate or postgraduate education. More than three-quarters of them lived in urban areas and they were married (76.5% and 74.6% respectively). Around seventy percent of them were working and reported that they have enough income with the same percentage for both (70.9%).

Table (2): Around two-thirds (62.5%) of the studied subjects didn't practice exercises. Only two percent of them were smokers, and more than one-third of them (41.2%) were obese. Around one-fifth (17.5%) reported that they slept less than six hours per day. Finally, around one-third (31.6%) of them reported that they eat vegetables daily.

Table (3): Around a tenth of the studied subjects had a history of diabetes and hypertension (14.1% and 13.3% respectively). Regarding the vulnerable group for COVID who living with the study subjects, around half (53.1%) of the studied subjects had children less than 13 years old in the same household, a quarter (25.2%) had elderly one-fifth (19.8%) had a chronically ill person and only 2% had a person who has immunodeficiency problems. More than one quarter (27.2%) of the studied subjects had a positive history of the family members with previous exposure to corona infection. Furthermore, less than three-quarters (70.4%) of them stated that they follow COVID-19 precautions in their homes. Slightly more than a tenth (13.7%) of them were isolated at the hospital for treatment (5.7%) of them admitted to ICU, (6.2% & 1.7%) admitted to chest department and emergency department respectively. Finally, (58.2%) of them reported that they were hey isolated for more than 10 days.

Figure (1): the most common complaints among the studied subjects were a pain in joints and bones, and cough among more than half (58%, 51.4% respectively), followed by severe fatigue, severe headache, and sore throat among (48.6%, 46.4%, & 40.5% respectively), followed by fever, shortness of breath, diarrhea and intestinal disturbance, & chest pain among (34.3%, 30.1%, 24.0%, & 19.5% respectively). Figure (2): slightly less than one-fifth percent (17.3%) of the studied subjects have the best quality of health compared to more than three-quarters (82.7%) of them who have the worst quality of health scores.

Table (4): around three-quarters (74.8%) of the study subjects stated that they have no problems with mobility, and the majority (88.4%) of them documented that they have no problems regarding their self-care activities. Furthermore, (17.5%, 4.0%, & 5.9%) respectively, of the studied subjects had moderate, severe, and extreme problems regarding the Usual activity dimension, while (24.9%, 2.0, & 2.0) respectively had moderate, severe, and extreme problems regarding the Pain/discomfort dimension. Finally, (21.5%, & 3.7%) respectively of them had moderate, severe, and extreme problems regarding the Anxiety /depression dimension. Figure (3) slightly less than sixty percent (59%) of the studied subjects have higher levels of resilience compared to 41% who have a lower level.

Figure (4) Portrays that slightly more than sixty percent (60.5%) of the studied subjects have major academic performance difficulties due to COVID-19

compared to 39.5% who have minor difficulties. Table (5): There is a statistically significant association noted between the studied subjects' HRQoL mean percent scores and their age, whereby with increased age the total quality of life increased ($F:13.797$, $P:<0.001$). Nearly the same findings were regarding resilience and age factor also, whereby increased age the total resilience score with a statistically significant association ($F:8.675$, $P:<0.001$). Additionally, there is a statistically significant association noted between the studied subjects' HRQoL mean percent scores and their gender, where females have a higher total quality of life than males ($F:19.357$, $P:<0.001$). In contrast, the resilience total scores were higher among males than females with no statistically significant association noted. One of the surprising findings noted is a statistically significant association noted between the studied subjects' HRQoL mean percent scores and their level of education, whereby with the increased level of education the total quality of life decreased ($F: 10.563$, $P:<0.001$). In contrast, the resilience total scores were higher among those who have a higher level of education than those who have just a basic level of education with a statistically significant association noted ($F: 16.234$, $P: <0.001$). There is no statistically significant association noted neither among subjects' HRQoL total scores nor resilience total scores and their residence in rural or urban areas and their belief in getting infection also.

There is a statistically significant association noted between the studied subjects' HRQoL mean percent scores and their income level, whereby with increased income level the total quality of life decreased ($F:19.514$, $P:<0.001$). In contrast, the resilience total scores were higher among those who have a higher level of income than those who have a lower level of income with a statistically significant association noted ($F:12.891$, $P: <0.001$). Furthermore, there is no statistically significant association noted between the studied subjects' HRQoL mean percent scores and their occupation. In contrast, the resilience total scores were higher among those who work than those who didn't work with a statistically significant association noted ($F:29.421$, $P: <0.001$). additionally, there is a statistically significant association noted between the studied subjects' HRQoL mean percent scores and their marital status, where married have lower HRQoL scores than single, widows, and divorced ($F:11.670$, $P:<0.001$). Whereas the total resilience scores were higher among married than single, widows, and divorced with a statistically significant association ($F: 26.904$, $P:<0.001$). Overall, there is no statistically significant association noted between all the socioeconomic variables and the academic performance of the studied subjects.

Table (6): There is a statistically significant moderate negative correlation noted between the study subject's total resilience scores and their health-related quality of life scores ($r:-.603$ ($P:0.000$)). There is a statistically significant weak positive correlation noted between the study subject's total academic performance scores and their health-related quality of life scores ($r:.350$ ($P:0.000$)). No correlation was noted between the study subject's total resilience scores and their total academic performance score.

Table (1) Distribution of The Study Subjects According To Their Sociodemographic Data

Sociodemographic data	No. (405)	%
Age (Years)		
Less than 20	16	4.0
20 to less than 30	206	50.9
30 to less than 40	112	27.7
40 to less than 50	64	15.8
50 and more	7	1.7
Sex		
Male	87	21.5
Female	318	78.5
Currently in education		
No	71	17.5
Yes	334	82.5
Highest level of education		
Basic	22	5.4
Secondary	71	17.5
BSc	184	45.4
Postgraduate	128	31.6
Place of residence		
Urban	310	76.5
Rural	95	23.5
Marital status		
Single	64	15.8
Married	302	74.6
Divorced	24	5.9
Widow	15	3.7
Occupation		
Working	287	70.9
Non-working	118	29.1
Income		
Not enough	95	23.5
Enough	287	70.9
Enough and save	23	5.7
Offspring numbers		
No	79	19.5
1-2	167	41.2
3-4	119	29.4
5 and more	40	9.9

Table (2) Distribution of The Study Subjects According To Their Lifestyle Pattern

Lifestyle pattern	No. (405)	%
Practice of exercise		
Didn't practice	253	62.5

Walking	136	33.6
Football	8	2.0
Swimming-Basket-Handball	8	2.0
Smoking		
Smoker	8	2.0
Non-smoking	397	98.0
Body weight		
Normal	231	57.0
Obese	167	41.2
Morbidly obese	7	1.7
Lifestyle pattern	No. (405)	%
Sleeping hours		
Less than 6 hrs.	71	17.5
6-8 hrs.	271	66.9
More than 8 hrs.	63	15.6
Daily eating of vegetables		
Yes	128	31.6
No	64	15.8
Sometimes	213	52.6

Table (3) Distribution of The Study Subjects According to Their Health History and COVID-19 Related Risk Factors

Health History and COVID-19 Related Risk Factors	No. (405)	%
Health problems		
▪ No	278	68.6
▪ Diabetes	57	14.1
▪ Hypertension	54	13.3
▪ Cardiac	9	2.2
▪ Respiratory	7	1.7
Vulnerable group for COVID living with the study subjects		
▪ Children less than 13	215	53.1
▪ Elderly	102	25.2
▪ Have chronic diseases	80	19.8
▪ Immunodeficiency	8	2.0
Positive history of family member had corona		
▪ Yes	110	27.2
▪ No	255	63.0
▪ Don't know	40	9.9
COVID precaution at home		
▪ Yes	285	70.4
▪ No	16	4.0
▪ Sometimes	104	25.7

Crowding working environment		
▪ Yes	88	30.7
▪ No	199	69.3
Received treatment under supervision		
▪ Yes	325	80.2
▪ No	80	19.8
Hospital isolation		
▪ Yes	55	13.6
▪ No	350	86.4
Admission dept		
▪ ICU	23	5.7
▪ Chest dept	25	6.2
▪ Emergency dept	7	1.7
▪ No	350	86.4
Isolation period		
▪ Less than 10 days	23	41.8
▪ More than 10 days	32	58.2

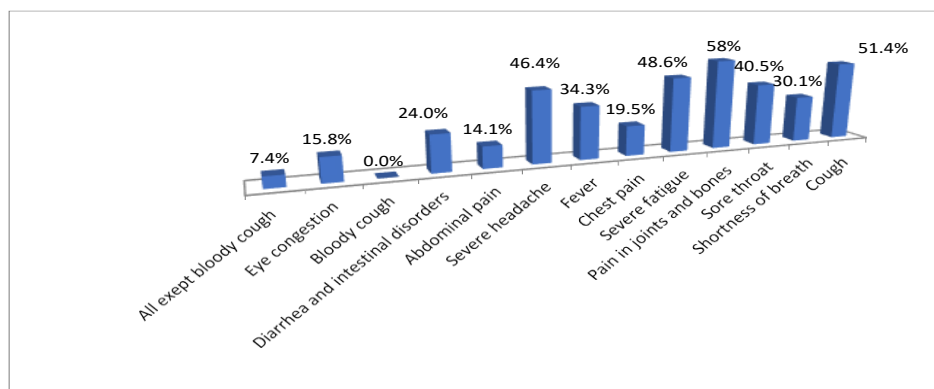


Figure (1) Distribution of the studied subjects according to their history of COVID-19 symptoms

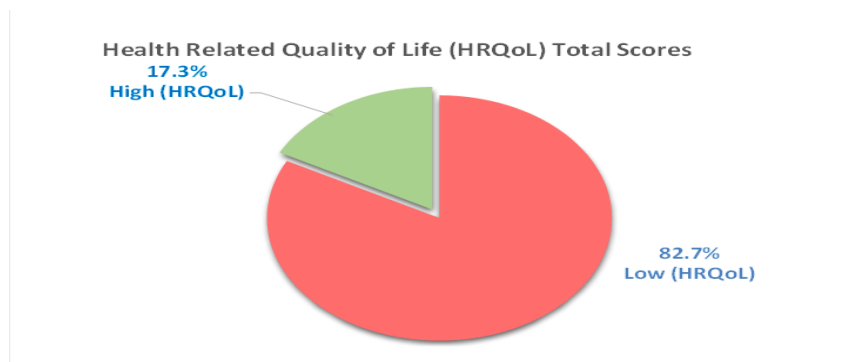


Figure (2) Distribution of the study subjects according to their health-related quality of life (HRQoL) total scores

Table (4) Distribution of The Study Subjects According To Their Health Related Quality of Life (HRQoL) Dimensions

HRQoL Dimensions	No. (405)	%
Mobility		
▪ No problems	303	74.8
▪ Slight problems	48	11.9
▪ Moderate problems	32	7.9
▪ Severe problems	22	5.4
Self-care		
▪ No problems	358	88.4
▪ Slight problems	32	7.9
▪ Moderate problems	15	3.7
Usual activities		
▪ No problems	215	53.1
HRQoL Dimensions	No. (405)	%
▪ Slight problems	79	19.5
▪ Moderate problems	71	17.5
▪ Severe problems	16	4.0
▪ Unable to/extreme problems	24	5.9
Pain/discomfort		
▪ No problems	168	41.5
▪ Slight problems	120	29.6
▪ Moderate problems	101	24.9
▪ Severe problems	8	2.0
▪ Unable to/extreme problems	8	2.0
Anxiety/depression		
▪ No problems	167	41.2
▪ Slight problems	136	33.6
▪ Moderate problems	87	21.5
▪ Unable to/extreme problems	15	3.7

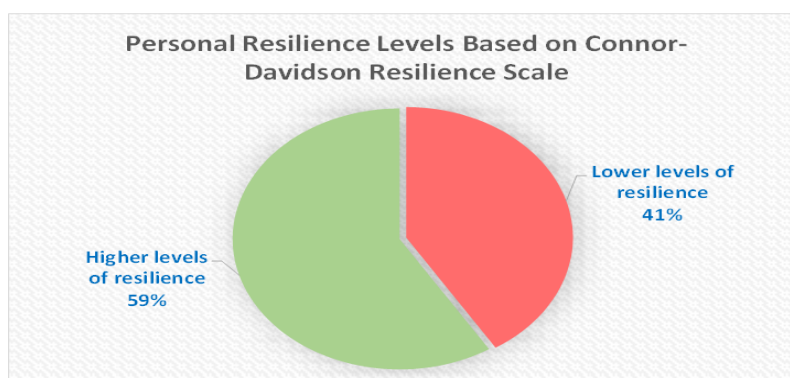


Figure (3) Distribution of the study subjects according to their personal resilience levels based on Connor-Davidson resilience scale

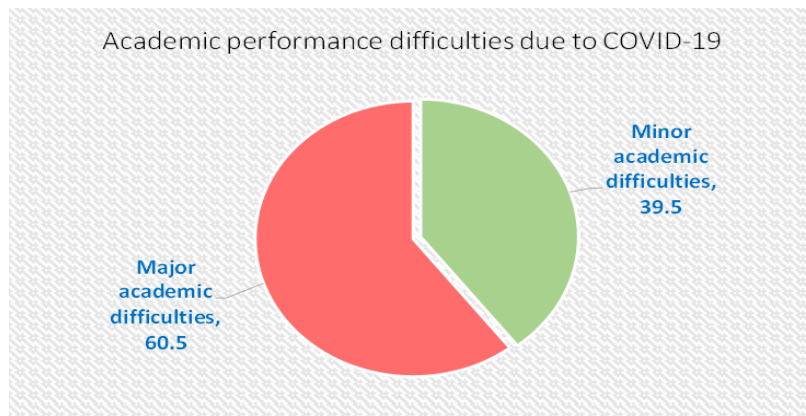


Figure (4) Distribution of the study subjects according to their academic performance difficulties due to COVID-19

Table (5) Distribution of The Study Subjects According To Their Sociodemographic Data, and their Mean Percent Scores of Health-Related Quality of Life (HRQoL) , Personal Resilience and Academic performance

Variables	HRQoL Score		Percent		Personal Resilience Percent Score		Academic performance difficulties	
	Mean	± SD	F value)	(P	Mean	± SD	F value)	(P
Age (Years)								
Less than 20	27.2±9.0		F:13.797 P:<0.001*		41.7±14.9		F:8.675 P:<0.001*	F:1.748 P: 0.176
20 to less than 30	31.6±11.2				53.4±12.0			
30 to less than 40	33.0±17.3				53.2±17.9			
40 to less than 50	33.5±11.4				54.6±10.8			
50 and more	49.4±18.2				44.8±17.5			
Sex								
Male	27.5±13.8		F:19.357	P:<0.001*	53.1±17.2		F:0.782	F:0.576
Female	34.9±13.9		P:<0.001*		51.5±13.8		P:0.377	P: 0.448
Currently in education								
No	40.0±16.3		F:19.900	P:<0.001*	51.0±15.0		F:0.294	-----
Yes	31.9±13.3		P:<0.001*		52.0±14.6		P:0.588	33.6±10.5 ---
Highest level of education								
Basic	44.7±18.3		F: 10.563 P:<0.001*		44.5±21.1		F:16.234 P:<0.001*	F:0.421 P: 0.738
Secondary	27.2±10.2				53.3±16.2			
BSc	34.9±14.7				47.8±13.7			
Postgraduate	32.5±13.0				58.1±10.9			
Place of residence								
Urban	33.0±12.5		F:0.712		51.4±14.0		F:1.129	F:0.063

Rural	34.4±18.7	P:0.399	53.2±16.4	P:0.289	56.4±16.9	P: 0.803
Income						
Not enough	40.8±16.9	F:19.514 P:<0.001*	45.4±17.5	F:12.891 P:<0.001*	56.2±16.9	F:0.150
Enough	30.7±11.3		53.9±11.9		55.8±17.8	P: 0.860
Enough and save	34.6±22.5		52.9±23.3		58.3±16.7	
Occupation						
Working	33.6±14.5	F:1.106	53.2±14.2	F:29.421	56.1±17.4	F:0.020
Non-working	31.3±11.7	P:0.294	41.4±13.4	P:<0.001*	55.7±18.1	P: 0.888
Maritalstatus						
Single	36.5±20.6	F:11.670 P:<0.001*	39.1±16.1	F:26.904 P:<0.001*	56.9±16.8	F:2.789
Married	31.2±11.1		55.0±12.3		55.1±17.8	P: 0.063
Divorced	45.3±9.6		51.2±8.7		63.7±13.8	
Widow	42.4±24.7		43.5±24.3		#-----	

F: ANOVA test P: P value of ANOVA test

*significant at $P \leq 0.05$

Nobody is widow among the studied group of those who currently in education and filled academic performance assessment tool.

Table (6) The Correlation Matrix between Total HRQoL , Total Resilience and Scores and Academic performance Regarding COVID-19

		Total HRQoL	Total resilience	Academic performance difficulties
Total HRQoL	Pearson Correlation (r)		-.603**	.350**
	Sig. (2-tailed) (P)		.000	.006
Total resilience	Pearson Correlation (r)	-.603**		-.020
	Sig. (2-tailed) (P)	.000		.711
Academic performance difficulties	Pearson Correlation (r)	.350**	-.020	
	Sig. (2-tailed) (P)	.006	.711	

** . Correlation is significant at the 0.01 level (2-tailed).

r: Pearson Correlation P: P value of Pearson Correlation

** Correlation is significant at the 0.01 level (2-tailed).

*Correlation is significant at the 0.05 level (2-tailed).

NB: $r < 0.2$: no correlation. r : 0.2-0.4: weak correlation. r : 0.4-0.6: A moderate correlation r : 0.6-0.8: A strong correlation. $r > 0.8$: A perfect correlation

Discussion

Two international conveyances and 210 nations and territories have been affected by the 2019 coronavirus infection (COVID-19). (WHO, 2020) The terrible illness COVID-19 can have a substantial impact on the daily life of recovered patients and their families. In 2020, Wang et al. The current study aimed at assessing the impact of COVID-19 on the health-Related Quality of Life and resilience among recovered patients.

Among 405 recovered patients of COVID-19, the current study results revealed that nearly half of the participants were aged from 40 – 59 years while the minorities were less than 20 or 60 years and more, which may be related to the old age people do not use internet or social media like younger so, they didn't reach to our electronic questionnaire. This current result is in accordance with those of (Meiling et al 2020) who found their Chinese participants were aged between 18 and 66 years ($M = 31.8$; $SD = 8.6$). as well, (WHO, 2020 and Berlin et al, 2020) stated that 35 years or above is a cut-off point for non-communicable disease development; therefore, people aged above 35 years are at increased risk of severe COVID-19. The current result disagrees with those of (Sohrabiet al, 2021) who found the mean $\pm$ SD age of the analytic population of their study was 52.8 ± 21.1 years (Median 54.0 years). Also, the report (CDC, 2021) mentioned that the risk of severe illness due to COVID-19 increases with age.

The current study results also found more than three-quarters of the participants were females. In accordance with this result, Meiling et al 2020 found most of their participants were females (61.2%), however, many studies were in contrast with the present study result such as the study of (Sohrabi et al, 2021) which indicated more than half of the population in their study were males, (50.5%). Also, the study by (Mohammad et al, 2021) found among 3244 participants, the majority were males (70.90%).

The current study result found more than three-quarters of the participants belonged to urban, which reflects the relationship between urban areas and COVID-19 which is attributed to density; connectivity; crowded living conditions, and exposed occupations. Also, most participants of our study were working, had a high level of education, and had enough income. The study results of (Mohammad et al, 2021) were in the same line and found (73.43%) of their participants lived in urban areas, maximum of participants completed graduation, and most of them had an average monthly family income range between (USD \$236- \$472). As well, the study by (Meiling et al, 2020) found most of the participants had a balance between income and expenditure (63.7%) and lived in urban areas (70.1%).

The existing current results revealed that around two-thirds of the participants didn't practice exercises, and more than forty percent of them were obese. These results are in line with (Klaus and Yukiko, 2020) who stated that harmful health behaviors, such as overeating, sedentary behavior with reduced physical activity, elevated alcohol and tobacco use, and increased screen time cause impaired sleep. All of these behaviors are associated with non-communicable diseases and can interfere with immunity. Also, (Goa et al) highlighted that obesity is a risk factor for advanced severity during COVID-19 infection. As well, (Hamer et al 2020) found a low amount of physical activity increases the risk of severe COVID-19 infection.

While no foods, single nutrient, or dietary supplements can prevent infection with COVID-19, a balanced diet containing enough macronutrients and diverse micronutrients is a prerequisite for an optimally functioning immune system. Most of the participants of our study didn't eat vegetables and fruits daily. This finding is compatible with those of (Clement et al, 2021) who found that fruits and

vegetable intake is negatively correlated with both COVID-19 incidences and COVID-19 deaths and suggest fruits and vegetable intake can help to combat SARS-CoV-2 infection.

The current study results indicated that more than a tenth of the participants had a history of diabetes and hypertension. In this context, the study result of (Mohsin et al, 2021), found diabetes was the second most common comorbidity reported, and according to their analysis, it causes 4.23 times increase in the risk of life-threatening COVID-19 infections. In the same vein (CDC, 2020), reported that approximately 90% of hospitalized patients identified through COVID-NET had one or more underlying conditions, the most common being obesity, hypertension, chronic lung disease, diabetes mellitus, and cardiovascular disease.

Concerning the presence of vulnerable people staying with our participants, the current study results revealed one-quarter of them living with the elderly, one-fifth of them living with chronically ill persons, and only two percent living with persons had immunodeficiency problems. These results are reflecting the increased risk of COVID-19 infection because those vulnerable persons are more liable to getting the infection and staying with them leads to more susceptibility to infection. From this point of view, (CDC,2021) report clarified that vulnerable populations including the elderly especially over 60 years, people with chronic medical conditions like lung disease, heart disease, high blood pressure, diabetes, and people who have an immunocompromised medical condition like cancer or taking medications to lower the immune system as chemotherapy, all of those more liable to attract COVID-19 infection. More than one-quarter of the current participants had a positive history of a family member with previous exposure to corona infection. As well, slightly less

than one-third of them mentioned that they had a crowded working environment. This reflects the possibility of close contact and the increased risk of infection in case of lack of commitment to precautions which include wearing a face mask, keeping a proper distance, hand washing, and Quarantine at home if needed as reported by the CDC, 2021. Less than three-quarters of the present participants followed COVID-19 precautions in their homes. it may be due to most of them being females and they are responsible for their family's safety so, phobia of infection made them apply the precautions. But homes are not the only source of COVID-19infection there are many sources such as occupational settings, transportation methods, health institutions ..etc, however, these results are in agreement with the study of (Irmak et al, 2020) which shows that women are more likely to perceive COVID-19 as a very serious health problem, to agree with restraining public policy measures, and to comply with them. Also (Science daily, 2020), illustrate that women have a substantially greater concern for COVID-19 than men.

The present study finding showed slightly more than a tenth of the studied subjects were hospitalized at different wards of the hospital, (5.7% %) admitted to ICU while the rest were admitted to chest or emergency department, as well as, more than half of them were isolated at hospitals for more than 10 days. These findings are in line with those of (Cyrus et al), who found that (5.92%) of their

study participants were hospitalized in ICU, (33.10%) were hospitalized for more than 4 days, (65.61%) had SpO₂ below normal values, and (11.5%) had moderate and severe pulmonary involvement.

The current study result revealed the most common symptoms reported from the participants in the current study were a pain in joints and bones, and cough among more than half of them followed by severe fatigue, severe headache, and sore throat among more than forty percent of them followed by fever, shortness of breath, diarrhea, and intestinal disturbance, & chest pain among more than quarter of them. These symptoms are in line with the findings of the CDC and WHO reports 2021, respectively, which noted that people with COVID-19 have reported experiencing a wide range of symptoms, from mild ones to severe illnesses. These symptoms may include fever or chills, cough, shortness of breath or difficulty breathing, fatigue, muscle or body aches, headache, the new loss of taste or smell, sore throat, congestion or runny nose, nausea or vomiting, and diarrhea.

Health-related quality of life (HRQoL) is one of the most important outcome measures for patients. Concerning the total score of (HRQoL), of the current study, the findings revealed that most of the participants had the worst quality of health scores. Because it's difficult to predict long-term outcomes from the new COVID-19 virus, scientists are looking at the long-term effects seen in related viruses, such as the virus that causes severe acute respiratory syndrome (SARS). Many people who have recovered from SARS have gone on to develop chronic fatigue syndrome, a complex disorder characterized by extreme fatigue that worsens with physical or mental activity but doesn't improve with rest. The same may be true for people who have had COVID-19 and reflect on their (HRQoL) In agreement with our result, the study by Monira et al, 2021 in Saudi Arabia indicated that more than half of the participants (54%) reported a relatively poor QoL among patients with COVID-19. Similarly, the study by Morteza et al, 2020 found the mean score for (HRQoL) in COVID-19 patients was low in their study, and the percentage of recovered individuals of COVID-19 reporting problems affecting their HRQoL in each dimension showed the most common problem was anxiety. In the same manner, the present study findings revealed that the most participants had no problems regarding mobility and self-care dimensions of (HRQoL), while more than one-quarter of them had problems ranging from moderate, severe to extreme concerning the usual activities, pain/discomfort, and anxiety/ depression dimensions. These results are incompatible with those of (Weiwei et al, 2020), they found the most frequently reported problems were pain/discomfort (19.0%) and anxiety/depression (17.6%). Logistic regression models showed that the risk of pain/discomfort and anxiety/depression among people with aging, chronic disease, lower income, epidemic effects, and worry about getting COVID-19 raised significantly. As well, the study conducted by (Bach et al, 2020) found that among the five dimensions of the (HRQoL) scale, the aspect with the highest proportion of having any problems was Anxiety/Depression (38.7%), followed by Pain/Discomfort (10.0%), Usual activities (8.5%), while the lowest percentage went to Self-care (0.3%).

The current findings indicated that the higher scores of (HRQoL) were associated with increasing age, this may be due to the most of the current study participants

were less than 60 years old, while the minority was elderly. This result is in line with those of (Weiwei et al, 2020) who found older age was associated with a decreased score of (HRQoL) in their study in China. Also, the study by Sommer et al 2020 found the older age groups of patients had lower scores of (HRQoL) compared with the younger patients and attributed this to the fact that COVID-19 impacts more on older patients.

In the same vein, women had higher a total score of (HRQoL) than men in the current study result, from the researcher's point of view, it may be due to most of them were working and had a good economic state which helped them to take proper medication and care during COVID-19 infection, or may be due to the Egyptian women have multiple responsibilities toward her family, if falls ill, she perseveres and resists in order to recover quickly and take care of her family. However, these findings in contrast with those of Morteza et al. 2020, and Monira et al, 2021, found women had lower scores of (HRQoL) than men in their studies in Iran and Saudi Arabia respectively.

Surprisingly, a higher level of education and income were associated with decreasing total score of (HRQoL) among the current study participants. This may be due to the sedentary lifestyle often associated with high social class and reflect that high education doesn't mean a good lifestyle, health awareness, and healthy behavior. However, these are incongruent with the study by Morteza et al. 2020, who observed that the difference between mean (HRQoL) scores in patients with different levels of education was significant. Lower scores of (HRQoL) were observed in patients with a higher level of education. As well as the result in contrast with (Weiwei et al, 2020) who found low family income associated with lower HRQoL. A positive correlation was noted between academic performance and health-related quality of life among the studied subjects of the current study. This finding reflects the influence of health-related quality of life dimensions (physical and psychological) on individual life. This result is consistence with the study of Shengxiang et al, (2020) who found a positive link between general health and HRQoL with academic performance among their studied subjects. Also, the study by Sarwar et al, 2019 found that student with better physical health, and mental health had better academic performance.

Resilience is a psychological coping mechanism that helps people actively respond to adversity. (Davydov et al, 2010), the current study findings indicated that forty-one percent of the participants had a low level of resilience, this may be explained as (Xiao et al, 2020) stated, the impact of the COVID-19 as a pandemic, leads to facing continuous changes in various aspects of individual lives, such as health, employment, and family life. This accumulation of multiple sources of stress could increase feelings of psychological distress and decrease feelings of well-being for many individuals and impair resilience.

The current study results indicated that the total scores of resilience were increasing with the association in increasing age, it may be attributed to life experiences they had and life achievements, and positive life outcomes. These are in line with the study by Regardt et al, 2020 who found the relationship between demographic variables and self-reported resilience and found that both age and education successfully indicated greater levels of resilience. Also, the results

found that married participants of the current study had a higher level of resilience than single, divorced, or widows, it may be due to emotional and family support as well as the presence of life achievements, and outcomes. This result is in contrast with the study by Cuiping et al 2008 who found the resilience level was higher among unmarried females than in married.

The present study results revealed that a higher level of resilience was among males than females. It may be related to the female patients were more prone to adopt avoidance strategies when facing negative events, while male patients were more inclined to choose positive coping strategies to solve the problems. Also, it was observed that highly educated, working, high-income male participants had a high level of resilience. It may be because high education gives more chances for jobs, it will improve the income, and consequently, the high income will give the opportunity to relieve the stress, & anxiety especially related to health care and family care. These results are compatible with (Zhong et al 2021) they found the resilience scores in male patients were higher than in female patients in their study. Also, they found, that the resilience scores in patients with a better family economic status were higher than those in patients with family economic difficulties.

Because most participants of the current study were females, and they had higher HRQoL scores, and lower resilience scores than males, it is not surprising to find a negative correlation between the participants' total resilience scores and HRQoL scores in the current study result. From the researcher's point of view, it may be attributed to a good person's health doesn't mean he has a high resilience because there are many predictors of resilience and health outcomes are not the only predictors of high resilience. Also, women after adversities and crises need safety, family, & social support, more than men, so even if they have wellness or good health after any health problem, they still need more support to cope and relieve their fear, stress, and anxiety. However, this result is in contrast with Siiri et al, 2021, who found half (42–48%) of the patients with COVID-19 had low resilience, which was correlated with low HRQoL, and indicated that higher resilience negatively correlated with anxiety and depression. As well, the study by Monira et al, 2021 in Saudi Arabia showed that resilience was a factor that influenced variance in quality of life among COVID-19 patients and indicated that people with high resilience responded actively to the current situation and, in turn, demonstrated good quality of life. Sixty percent of the studied subjects were influenced negatively due to COVID-19. This result reflects the challenges facing those students because of the sudden

shifting of learning from traditional to online which enforced them to change and adapt without training. This result agrees with Meng et al. (2020), who denote that practically all nations have witnessed changes in education since the COVID-19 epidemic spread. Universities have changed teaching and learning, and lecturers are now offering online courses. (Rahim and Chandran, 2021). Also, many studies as Mukhtar et al. (2020), Snoussi (2019), Almaiah et al. (2020), Almanthari et al. (2020), Alqahtani and Rajkhan (2020), and Dhawan (2020) argued that insufficient resources, problems in maintaining academic integrity, issues in policy, lack of students' self-discipline, technical issues and lack of confidence were the main challenges in implementing online learning during the

COVID-19 pandemic. In the same vein, Mahdy, 2020 study on 1,392 participants from 92 different countries showed that the COVID-19 pandemic lockdown affected the academic performance of most participants (96.7%) with varying degrees especially students of practical faculties

Limitations of the study

Difficult collection of the required number of respondents by interview due to social distance precautions during data collection duration which gave a chance for questionnaire misinterpretation, lack of interest, negative response, and a long time to return the questionnaire.

Conclusion

Based on the current study results it can be concluded that: there were many risk factors that played a vital role in getting an infection of COVID-19 among the participants, such as obesity, sedentary lifestyle, lack of daily eating of vegetables and fruits, history of chronic diseases especially diabetes, and hypertension, and living with elderly and chronically ill family members. Whereas there is a statistically significant weak positive correlation noted between the study subject's total academic performance difficulties scores and their health-related quality of life scores. No correlation was noted between the study subject's total resilience scores and their total academic performance difficulties scores.

Most recovered patients of COVID-19 in the current study had low total scores regarding the health-related Quality of Life (HRQoL), these low scores (HRQoL) were commonly found among younger, men, low-educated, and low-income participants. Also, forty-one percent of the recovered patients had low total scores of personal resilience, these low scores were commonly found among younger, women, unmarried, and low-educated participants. Finally, a negative correlation between the participants' total resilience scores and HRQoL scores was found in the current study.

Recommendations

Based on the previous findings the following recommendations are suggested:

- Health education interventions to improve lifestyle and enhance the immunity health of individuals to eliminate the risk factors of getting COVID-19 infection.
- A physical and psychological rehabilitation program directed for recovered patients of COVID-19 especially young age, low educated, and low-income individuals to improve their health-related quality of life and personal resilience.
- Further research to compare the impact of COVID-19 on the physical and mental health of males and females.

Acknowledgement

The authors would like to express their appreciation to the studied subjects who devoted their time to participating in this research.

Conflict of interest

The authors declared that they have no conflict of interest.

Author contribution

All the authors were part of the initial design of the research. They shared collected and analyzed the data, wrote, and edited the final version of the text of the manuscript and formatted it, and submitted it for publication.

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International Journal of General Medicine. Volume 14