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The Combined Outcomes of the COVID-19 Pandemic and a Collapsing Economy on Mental Well-Being: A Cross-Sectional Study

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Abstract

Objective: This study aimed to examine the outcomes of COVID-19 and a collapsing economy on the mental well-being (MWB) of the general Lebanese population. **Methods:** A cross-sectional study was conducted online in May 2020 and enrolled 502 adults.

Results: Mental well-being had a mean of 14.80 (14.37; 15.24). A lower MWB was associated with female gender (beta=−1.533 [−2.324; −0.743]), university education (beta=−2.119 [-3.353;-0.885]), fear of COVID-19 (beta=−0.131 [−0.199; −0.063]), fear of poverty (beta=−0.232 [−0.402;−0.063]), verbal violence at home (beta=−3.464 [−5.137; −1.790]), and chronic disease (beta=−1.307 [−2.283; −0.330]). Better family satisfaction (beta=0.380 [0.235; 0.525]) and better financial situation (beta=0.029 [0.003; 0.055]) were significantly correlated with better MWB. In the subsample of workers/looking for a job, additional factors affected MWB: physical exercise (beta =1.318 [0.370; 2.265]) was associated with better QOL, while being a previous waterpipe smoker, being self-employed before the crisis (beta=−1.22 [−2.208;−0.231]), working from home since the economic crisis (−1.853 [−3.692; −0.013]), and worrying about the long-term effects of the crisis on one's employment status (beta=−0.433 [−0.650; −0.216]) were associated lower MWB. It is noteworthy that closure of the institution yielded a borderline result (B = −1.2; p = .094), while the fear of COVID-19 was not significantly associated with MWB (B = −0.054; p =0.192).

Conclusion: This study showed that, during the pandemic, economic and other factors, directly or indirectly related to COVID-19, significantly affected quality of life. The fear of COVID-19 and fear of poverty mainly impacted the MWB of the general population. However, the fear of COVID-19 lost its significance among workers, who reported that factors negatively affecting their MWB are directly related to their employment and the already collapsing economy in Lebanon.

Keywords

COVID-19 pandemic, mental well-being, declining economy, fear of poverty, fear of COVID-19

Introduction

The coronavirus disease outbreak or COVID-19 that first emerged in Wuhan, China, in December 2019, has rapidly become a global threat (Wang et al., 2020; Yi et al., 2020). It was declared a pandemic by the World Health Organization (WHO) in March 2020 and has been considered a public health emergency of international concern ever since (Sohrabi et al., 2020).

COVID-19 is rapidly spreading in the population, primarily affecting patients' lungs, and causing mild to severe forms of respiratory illnesses, sometimes associated with intensive care unit (ICU) admissions and high mortality (Insider MJ Business,

2020; International Council for Small Business, 2020; Sohrabi et al., 2020; Yi et al., 2020). To curb the spread of the virus and alleviate the burden on the healthcare system, governments across the globe deployed public health responses and imposed containment measures, including social distancing, self-isolation, quarantine, and local and international travel restrictions. On 25 March 2020, an estimated 2.6 billion people (one-third of the human population) were under some form of lockdown (Insider MJ Business, 2020; International Council for Small Business, 2020). As of 17 May 2020, the pandemic resulted in 4,534,731 confirmed cases of COVID-19 infections and 307,537 deaths worldwide (Khan et al., 2020).

Throughout history, epidemics and pandemics have had manifold and profound, long-lasting impacts on mental health and mental well-being (MWB) (Huremović, 2019). COVID-19, in particular, has been described as the "useable and mysterious", thus triggering anxieties and fear, potentially affecting MWB (Coelho et al., 2020; Labadi et al., 2022). Mental well-being, as described by the World Health Organization (WHO), consists of a state in which "the individual realizes his or her own abilities, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to his or her community". mental well-being includes cognitive, emotional, and behavioral responses at a personal level that should be interpreted in the socio-cultural context of the individual (Khan et al., 2020). Several studies evaluated MWB related to the COVID-19 pandemic, but none considered the economic context (Badahdah et al., 2020; Labadi et al., 2022; Matthes et al., 2021; Sibley et al., 2020; Vindegaard & Benros, 2020; Zsido et al., 2022). Indeed, another impact of COVID-19 is the slowing down of major world economies with a higher risk for developing ones. Containment strategies of flattening the curve most countries adopted to avoid overwhelming the healthcare system induced a global economic slowdown with layoffs and firms exits, generating an abrupt increase in unemployment (International Council for Small Business, 2020; Barcelo & Lopez-Leyva, 2021).

The first COVID-19 positive case in Lebanon was confirmed on 21 February 2020. As of this date, the government implemented stepwise measures to curb the spread of the disease; 1 week after, schools were closed. Other escalating steps ensued until the sanitary lockdown on 15 March (Rossi et al., 2020).

The COVID-19 outbreak coincided with an unprecedented economic crisis in the country. This Middle-Eastern developing country was recently downgraded from a high-income to upper-middle-income country by the World Bank (Arezki et al., 2018). Indeed, Lebanon has been witnessing slow economic growth over the past few years that reached monetary tightening in 2019 (World Health Organization, 2021) and resulted in an unprecedented crisis with massive demonstrations, strikes, and temporary bank closures (The World Bank, 2019a). Since then, banks have become unable to supply depositaries with money, whether Lebanese Pounds or US Dollars, the two currencies used in Lebanon. Furthermore, USD exchange rates have skyrocketed, making the paper money in that currency and other foreign currencies scarce or unavailable (Bloomberg, 2019). This economic frailty is mainly due to its non-productive structure added to corruption, political instability, and jostling, further aggravated by

the massive influx of Syrian refugees (World Health Organization, 2021). Given that the COVID-19 pandemic has already affected the major world economies, with some of them heading towards a sharp recession (Baldwin & Weder di Mauro, 2020), it was expected that Lebanon would be no exception, with the health crisis deepening the country's already collapsing economy, thereby altering MWB in the general population. Studies exploring this facet of the pandemic are lacking.

This study's hypotheses derive from the biopsychosocial model, which views health and well-being as products of biological characteristics (e.g., immune function, sex, disease vulnerability), behavioral/psychological factors (e.g., stress, coping mechanisms, health beliefs), and social conditions (e.g., cultural influences, family relationships, education, economic status, social support). It was postulated that the general population is at risk of low mental well-being given that many of these conditions are affected, i.e., biological (disease vulnerability and family history of COVID-19), psychological (fear of COVID-19 and stress), and social (economic breakdown) factors. Therefore, this study aimed to examine the combined outcomes of the COVID-19 pandemic and a collapsing economy on the mental well-being of the general Lebanese population.

Material and Methods

Study Design and Sampling

A cross-sectional study was conducted from 10-18 May 2020, using an online-based questionnaire created on Google forms. Due to the government-mandated sanitary lockdown, the survey was distributed to participants through social media platforms and WhatsApp groups, using the snowball sampling technique. All individuals over 18 years of age with access to the Internet were eligible. A total of 502 respondents filled out the questionnaire that required between 15 and 20 minutes to complete. The distribution over the regions was as follows: 16.7% in Beirut (the city capital), 44.2% in Mount Lebanon, 15.9% in the North, 13.8% in the South, and 9.5% in the Beqaa.

Ethics Approval and Consent to Participate

The study protocol was approved by the Institutional Review Board of the American University of Science and Technology approved (IRB application number AUST-IRB-20,200,527–01). The topic was explained to all participants in the introductory section of the survey, and consent to participate was implicit. The anonymity of participants was guaranteed throughout the process of data collection and analysis.

Sample Size Calculation

The minimum sample size was calculated using the G-Power software, version 3.0.10. The calculated effect size was 0.0526, expecting a squared multiple correlation of 0.05 (R^2 deviation from 0) related to the Omnibus test of multiple regression. The minimum

necessary sample was $n = 454$, considering an alpha error of 5%, a power of 80%, and allowing 25 predictors to be included in the model.

Questionnaire

The online questionnaire was available in Arabic, the native language in Lebanon (https://forms.gle/WbixEdxb5CFdnBBy6). It consisted of three parts: (1) Sociodemographic features of the participants; (2) Questions related to the combined impact of the COVID-19 pandemic and economic crisis; (3) Outcome measures (mental well-being, fear of COVID). The questionnaire included several measures using validated scales; all were used after obtaining the due permission from their copyright holders when necessary.

Sociodemographic Factors of the Participants. The first part assessed the sociodemographic features of the participants, such as age, gender, marital status, educational level, employment status, region, household size, current household monthly income, and socioeconomic status, assessed using quartiles of individual income (household income divided by the household size). Current household income was divided into five levels, according to the official exchange rate, i.e., no income, low<675,000 LBP (450 USD), moderate 675,000–1,500,000 LBP (450–1000 USD), intermediate 1,500,000–3,000,000 LBP (1000–2000 USD), and high income >3,000,000 LBP (2000 USD). Other questions were related to medical coverage, smoking status, alcohol consumption, self-perception of the financial situation, having been infected or in contact with people infected with COVID-19, and physical activity before and during COVID-19.

This section also included two validated tools, the family APGAR index (Díaz-Cárdenas et al., 2017) and the fear of COVID-19 scale (Ahorsu et al., 2020).

The Family APGAR Index

This short self-reported instrument evaluates the satisfaction with global family function. It consists of five questions, each corresponding to a component of family function, i.e., Adaptation, Partnership, Growth, Affection, and Resolve (APGAR). All items are scored on a 3-point Likert scale: 0 (hardly ever), 1 (some of the time), and 2 (almost always). The total score ranges from 0 to 10. Higher scores indicate higher satisfaction with family function. In this study, $\alpha_{Cronbach}$ =0.927 and McDonald's Omega =0.926 (Dunn et al., 2014).

The Fear of COVID-19 Scale

The fear of COVID-19 scale is a 7-item tool used to measure the extent of fear of COVID-19 in adult people. It is scored on a 5-point Likert scale from 1 (strongly disagree) to 5 (strongly agree). The total score ranges from 1 to 35, with higher scores

indicating greater fear of COVID-19. In this study, $\alpha_{Cronbach}$ =0.893 and McDonald's Omega =0.884 (Dunn et al., 2014).

Impact of COVID-19 and Economic Crisis on Employment Status. The second part of the questionnaire addressed working people and those seeking a job and consisted of a set of questions related to current employment and how it was affected by either the economic crisis or the COVID-19. Examples of questions asked: Do you have to go out to make a living despite the sanitary lockdown? Are you able to apply social distancing while working (1.5–2 m safety distance)? Did your company change the working hours because of the economic crisis or the COVID-19 pandemic? Has your salary/income been affected by the economic crisis or the COVID-19 pandemic? Are you worried about the long-term impact of the economic crisis or the COVID-19 pandemic on your business/job? Did the economic crisis or the COVID-19 pandemic result in decreased salaries of employees? Did the economic crisis or the COVID-19 pandemic cause the dismissal of some employees? What were the criteria used to lay off employees?

This section also included the InCharge Financial Distress/Financial Well-Being (IFDFW) validated scale (Prawitz et al., 2006). This 8-item tool measures the perceived financial distress/well-being on a linear scale from 1 to 10). Lower scores reflect higher financial distress and lower well-being In this study, $\alpha_{Cronbach}$ =0.925 and McDonald's Omega =0.923 (Dunn et al., 2014).

Mental Well-Being. Mental well-being was evaluated with one of the most widely used questionnaires assessing subjective psychological well-being, i.e., the self-reported 5-item World Health Organization Well-Being Index (WHO-5) that has been translated into more than 30 languages since its first publication in 1998 and has been used in research studies all over the world (Topp et al., 2015). The version validated in Lebanon (Sibai et al., 2009) was used. It consists of five questions graded from 0 to 5 to evaluate mental well-being in the past month (feeling cheerful and in good spirits, calm and relaxed, active and vigorous, fresh and rested, and daily life filled with things that interest the participant). The total score ranges from 0 to 25; higher scores indicate better mental well-being. In this study, $\alpha_{Cronbach}$ =0.796 and McDonald's Omega =0.709 (Dunn et al., 2014)).

Translation Procedure and Piloting

All the scales used in this paper were translated into Arabic, except for the WHO-5, which was already validated and available in this language. Three authors performed the forward translation, and the other four did the back translation. Discrepancies between original English versions and translated ones were resolved by consensus.

The questionnaire was pilot tested with 10 people unfamiliar with the study to get to the final version; answers were not included in the final dataset.

Statistical Analysis

Data were collected using Google Forms and generated on an Excel sheet, then analyzed on IBM SPSS® software version 23.0. The database was weighted according to gender, age, and region of residence, based on the Central Administration of Statistics (Zhou et al., 2020) before analysis.

For the descriptive analysis, frequencies and percentages were used for categorical variables and means and standard deviation for quantitative variables. For the dependent variable (WHO-5), the median and the interquartile range were also presented for descriptive purposes. The distribution of the WHO-5 variable was considered normal on visual inspection of the histogram, while the skewness and kurtosis were both lower than 1. These conditions are considered compatible with normality in a sample size higher than 300 (Mishra et al., 2019).

For the bivariate analysis of continuous variables, the Student's T-test was used to compare the means between two groups and ANOVA was used to compare between three groups or more after checking for homogeneity of variances using Levene's test; when variances were not homogenous, the corrected T-Test and the Kruskal–Wallis test were used, respectively. Post-hoc analyses were conducted, after ANOVA and Kruskal-Wallis comparisons, using Bonferroni adjustment. The McNemar-Bowker test was used to compare categorical variables before and after the beginning of the economic crisis. A Spearman correlation coefficient was used to correlate between scale variables. In all cases, a p-value lower than 0.05 was considered significant.

Regarding the multivariable analysis, a multiple linear regression was conducted to assess the correlates of WHO-5 in the whole sample and adjust for potential confounding after checking the residues normality, linearity of the relationship, absence of multicollinearity, and homoscedasticity assumptions. A stepwise method was used to reach the most parsimonious model. As for the workers/trying to work subgroup analysis, a linear regression using the Generalized Linear Model was used since the additional variables related to work conditions were multinomial. The ENTER method was used to reach the appropriate model with appropriate assumptions. Independent variables included in the models had a p-value lower than 0.1 in the bivariate analysis, considering the allowed maximal number of variables to be included given the sample size. The beta coefficient, its 95% Confidence Interval (CI), and the p-value were reported in both models.

Results

Characteristics of Participants

The sample (n = 502) consisted of 52.7% female, 57.8% married, and 88.5% university degree holders. Only 32% of participants lived in a household of fewer than four persons, 58.8% had one or more dependent children, and 33.2% lived in a house of fewer than five rooms. Moreover, 39.3% of participants never consumed alcohol,

66.6% never smoked cigarettes, and 72.3% never smoked a waterpipe. Around 6% reported verbal violence at home, while other reported types of domestic violence accounted for less than 2%. Furthermore, 71.9% of the sample had an employment (61.9%) or were looking for one (10%), 10.3% were housewives or never worked, 9.9% were students, and 7.9% had retired (Table 1).

Mental Well-Being Distribution

In this sample of the general Lebanese population, MWB had a mean of 14.80 (SD = 4.93; 95% CI [14.37; 15.24]), a median of 14 (IQR =11; 19), and a range between 2 and 25 (Figure 1).

Sociodemographic Characteristics and MWB

A better mean MWB was associated with the male gender (15.61), an education below the university level (16.03), no alcohol consumption (15.29), no waterpipe smoking (15.10), and higher satisfaction with family life (APGAR). Occasional cigarette smokers (13.69) and participants who reported violence in their homes (11.37) had lower mean MWB. Additionally, a significantly positive correlation was found for the APGAR family scale and the WHO-5 (r = 0.251). No significant differences were found for the remaining characteristics (Table 1).

Economic Characteristics and MWB

People who subjectively classified themselves as belonging to the middle class both prior to the economic crisis and the pandemic (15.02) and after (15.39) had a better MWB; the more people feared poverty, the lower their MWB (r = −0.236). On the contrary, the better their current financial situation, the better their MWB (r = 0.206) (Table 2).

Figure 2 shows the sample's subjective assessment of the socioeconomic status before and after the COVID-19 pandemic; it revealed a significant decrease ($p < 0.001$) of wealthy and middle classes self-classification versus a notable increase in low and below poverty categories.

Professional Characteristics and MWB

When comparing individuals who were employed and those looking for employment (looking for a job/licensed from work), the latter had a lower mean MWB (12.77) compared to those still working (mean MWB varies from 14 to 15). Since the beginning of the economic crisis (not the COVID-19 crisis), workers who were still employed (15.51) had the best MWB compared to all other categories (12–14). Employees who reported a current decrease in salary (25–50%) or were dismissed from work (25–75%) had significantly affected MWB compared to workers employed at companies that were

Table 1. Sociodemographic Characteristics and MWB.

Characteristic	Frequency (%) *N* = 502 (100%)	Unadjusted MWB mean (*SD*)	*p*-value
Gender			
Male	237 (47.3%)	15.61 (5.02)	<0.001[a]
Female	265 (52.7%)	14.08 (4.74)	
Marital status			
Single	189 (37.6%)	15.26 (5.08)	0.243
Married	290 (57.8%)	14.57 (4.78)	
Widowed/divorced	23 (4.6%)	14.01 (5.44)	
Level of education			
Less than university	58 (11.5%)	16.03 (4.97)	0.044[a]
University degree	445 (88.5%)	14.64 (4.90)	
Dwelling region			
Beirut (capital)	84 (16.7%)	14.06 (4.45)	0.115
Mount Lebanon	222 (44.2%)	14.62 (4.70)	
South Lebanon	69 (13.8%)	15.93 (5.15)	
Beqaa plain	47 (9.5%)	14.34 (4.50)	
North Lebanon	80 (15.9%)	15.40 (5.90)	
Household size			
Lower than 4	161 (32.1%)	14.79 (4.64)	0.113
4 persons	137 (27.2%)	14.05 (5.18)	
5 persons	122 (24.2%)	15.10 (4.37)	
6 and more	83 (16.5%)	15.63 (5.69)	
Number of dependent children			
None	207 (41.2%)	15.35 (5.07)	0.163
1 child	46 (9.1%)	14.37 (5.25)	
2 children	132 (26.3%)	14.17 (4.54)	
3 or more	118 (23.4%)	14.73 (4.94)	
Number of rooms other than the kitchen and bathrooms			
<5 rooms	167 (33.2%)	15.05 (4.84)	0.775
5 rooms	138 (27.6%)	14.72 (4.86)	
6 rooms	109 (21.8%)	14.87 (4.79)	
7 or more	87 (17.4%)	14.39 (5.43)	
Alcohol consumption			0.018[a]
Previous	14 (2.8%)	11.52 (2.72)	Ref
None	197 (39.3%)	15.29 (5.23)	0.035
Occasional	248 (49.3%)	14.47 (4.72)	0.176
Regular	44 (8.7%)	15.51 (4.80)	0.051
Cigarette smoking			0.040[a]
Previous	21 (4.1%)	14.15 (5.99)	0.905

(continued)

Table 1. (continued)

Characteristic	Frequency (%) *N* = 502 (100%)	Unadjusted MWB mean (*SD*)	*p*-value
None	334 (66.6%)	14.93 (4.88)	0.847
Occasional	87 (17.4%)	13.69 (4.82)	0.038
Regular	60 (11.9%)	15.95 (4.77)	Ref
Waterpipe smoking			0.009[a]
Previous	27 (5.3%)	12.41 (3.88)	Ref
None	363 (72.3%)	15.10 (4.99)	0.038
Occasional	79 (15.7%)	13.87 (4.96)	1.000
Regular	33 (6.7%)	15.66 (4.22)	0.066
Violence at home[b]			
Verbal violence versus no	30 (5.9%)	11.37 (4.52)	<0.001[a]
Physical violence versus no	8 (1.6%)	11.35 (5.27)	0.301
Sexual violence versus no	7 (1.4%)	11.94 (4.99)	0.727
Other violence versus no	8 (1.6%)	11.35 (5.27)	0.324
No violence	472 (94.1%)	15.07 (4.91)	Ref
Professional status			0.075
Works/looking for a job	361 (71.9%)	14.60 (4.75)	Ref
Housewife/never work	52 (10.3%)	15.12 (4.42)	1.000
Student	50 (9.9%)	16.44 (5.60)	0.081
Retired	40 (7.9%)	14.21 (5.94)	1.000
	Mean (*SD*)	Unadjusted correlation (r)	*p*-value
Age in years	42.47 (14.06)	−0.057	0.219
APGAR family	7.81 (2.72)	0.251	<0.001[a]

[a]Statistically significant result.
[b]More than one option is possible.

not being affected by the crisis. Moreover, incremental concern that the current crisis would affect one's employment was inversely related to MWB ($r = -0.206$) (Table 3).

COVID-19 Exposure, Health Characteristics, and MWB

Regarding health-related matters, only 0.6% of participants reported having been infected with COVID-19. Physical activity significantly improved MWB (15.23 vs. 14.05, with nearly 30% of the population reporting an increase in the time they dedicated to physical exercising), while having a chronic disease decreased MWB (13.90 vs. 15.04). In addition, the fear of becoming unable to supply themselves with their medications (13.67) and the fear of going out to receive treatment (13.16) were significantly associated with lower MWB. The higher the fear of COVID-19, the lower the MWB ($r = -0.228$) (Table 4).

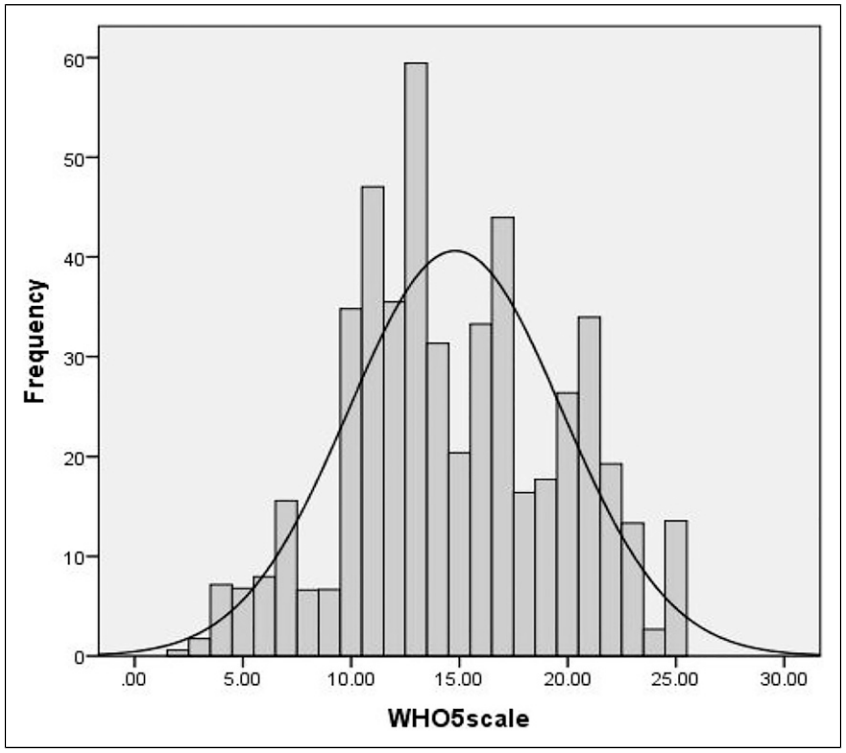

Figure 1. Histogram of quality of life in the lebanese population (n = 502).

Multivariable Analyses: Correlates of WHO-5

The multivariable analysis (Table 5) showed that correlates of MWB differed between the entire sample and the workers/looking for a job subsample.

In entire full sample, better satisfaction from family (B=0.380; $p < .001$) and a better financial situation (B=0.029; $p = .027$) were significantly correlated with better MWB. However, a lower MWB was significantly different among females (B = −1.533; $p < .001$), participants who attended university (B = −2.119; $p = 0.001$), participants who exhibited fear of COVID-19 (B = −0.131; $p < 0.001$), participants who manifested fear of poverty (B = −0.232; $p = .007$), participants who reported verbal violence at home (B = −3.464; $p < .001$), and the ones who had a chronic disease (B = −1.307; $p = .009$).

When comparing adjusted betas, the APGAR score is the most important positive correlate of MWB, followed by financial well-being. Regarding negative correlates, verbal violence at home, fear of COVID-19, and female gender were the most important (Table 5).

Table 2. Economic Characteristics and MWB.

Characteristic	Frequency (%) *N* = 502 (100%)	Unadjusted MWB mean (*SD*)	*p*-value
Subjective assessment before COVID crisis			0.009[a]
No answer	5 (1.0%)	12.31 (4.42)	1.000
Rich	30 (6.1%)	13.93 (5.26)	0.222
Middle class	448 (89.2%)	15.02 (4.92)	0.015
Middle to low	11 (2.1%)	13.42 (3.74)	0.859
Below poverty line	8 (1.6%)	9.49 (1.84)	Ref
Subjective assessment after COVID crisis			0.007[a]
No answer	14 (2.8%)	13.80 (5.05)	1.000
Rich	5 (1.1%)	15.54 (4.27)	1.000
Middle class	327 (65.1%)	15.39 (5.09)	0.007
Middle to low	137 (27.2%)	13.69 (4.32)	Ref
Below poverty line	19 (3.8%)	13.29 (5.00)	1.000
Current health coverage			
No health coverage	53 (10.5%)	14.31 (4.69)	0.213
Private insurance	205 (40.8%)	15.03 (5.06)	
Social security	155 (30.9%)	14.41 (4.77)	
Other public coverage	90 (17.8%)	15.61 (5.17)	
Household income			
Less than 675,000LP	15 (2.9%)	13.74 (4.40)	0.370
675,000–1,500,000LP	64 (12.8%)	14.10 (4.63)	
1,500,000–3,000,000LP	149 (29.7%)	14.67 (5.01)	
More than 3,000,000LP	274 (54.5%)	15.10 (4.93)	
Socioeconomic quartile			
Quartile 1	134 (26.6%)	15.02 (4.75)	0.733
Quartile 2	142 (28.3%)	14.85 (5.44)	
Quartile 3	119 (23.7%)	14.39 (4.81)	
Quartile 4	101 (20.1%)	15.02 (4.68)	
	Mean (*SD*)	Unadjusted correlation (r)	*p*-value
Fear of poverty	6.90 (2.65)	−0.236	<0.001[a]
IFDFW financial wellbeing scale	39.9 (17.33)	0.206	<0.001[a]

[a]Statistically significant result.

In the subsample of workers/looking for a job, additional factors affected MWB. Waterpipe smoking [current (B = 3.079; $p = 0.024$) or none (B = 2.297; $p = 0.044$) versus previous smoking] and physical exercise (B = 1.318; $p = .006$) were associated with better MWB, while being self-employed before the crisis (B = −1.22; $p = .016$), working from home since the economic crisis (B = −1.853; $p = .048$), and worrying

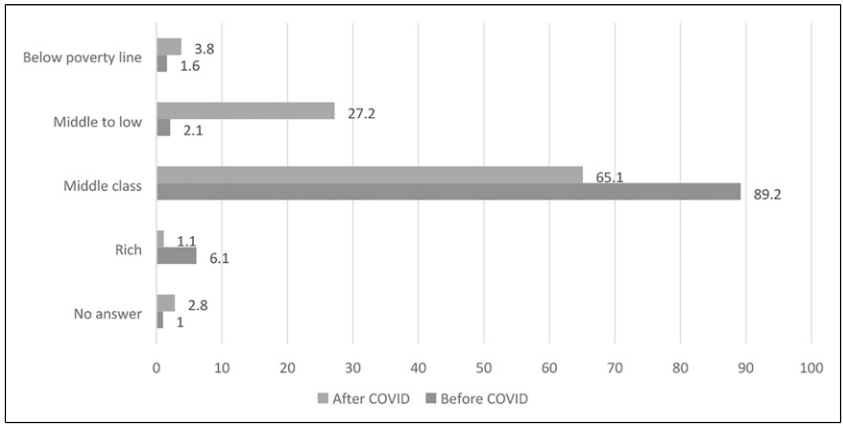

Figure 2. Subjective economic status assessment of lebanese population before and after COVID-19 crisis. Percentages are shown; *p*-value for McNemar-Bowker test <0.001.

about the long-term effect of the crisis on one's employment status (B = −0.433; $p <$ .001) were associated with a lower MWB. It is noteworthy that closure of the institution yielded a borderline result (B = −1.2; $p = .094$), while the fear of COVID-19 was not significantly associated with MWB (B = −0.054; $p = .192$).

When comparing standardized betas among workers, the APGAR scale and physical activity had the highest positive impact on MWB, while being worried about employment, the female gender, and university education seemed to have the highest negative impact on MWB (Table 5).

Discussion

This study shed light on the combined effects of the current economic crisis and COVID-19 pandemic on the MWB in the general population in Lebanon. It showed that, during the pandemic, several factors, directly or indirectly related to COVID-19 and the economic situation, significantly affected the MWB of the general population.

Female gender, university education, fear of COVID-19, fear of poverty, verbal violence at home, and chronic disease were associated with lower MWB. Participants with better family satisfaction (higher APGAR scores) and a more favorable financial status seemed to be at lower risk of being affected by both the pandemic and the economic situation since they exhibited better MWB. Among workers and participants looking for a job, additional factors were identified, mainly related to the employment status and the collapsing Lebanese economy: being self-employed before the crisis, working from home, closure of the institution, and worrying about the long-term effects of the crisis on employment status. Previous waterpipe smoking was also correlated to

Table 3. Professional Characteristics and MWB.

Characteristic	Frequency (%) *N* = 361 (100%)	Unadjusted MWB mean (*SD*)	*p*-value
Public sector work	65 (17.9%)	14.62 (4.58)	0.866
Private sector work	296 (82.1%)	14.50 (5.53)	
Income basis			
Own business	81 (22.4%)	14.84 (4.11)	0.116
Project basis	11 (3.1%)	16.97 (4.37)	
Monthly income	246 (68.1%)	14.58 (4.97)	
Daily wages	23 (6.4%)	12.90 (4.29)	
Healthcare profession			
No	173 (48.0%)	187 (37.3%)	0.359
Yes	187 (37.3%)	14.38 (4.66)	
Work before economic crisis[b]			
Works on his/her own versus no	130 (35.9%)	14.00 (4.41)	0.076
Owns an enterprise versus no	93 (25.7%)	13.93 (4.35)	0.100
Managerial position versus no	155 (42.8%)	14.78 (4.93)	0.519
Employee versus no	208 (57.7%)	14.53 (4.87)	0.764
Looking for a job versus no	41 (11.3%)	13.25 (4.35)	0.052
Work during COVID crisis[b]			
Goes to work now versus no	197 (54.6%)	14.63 (4.99)	0.903
Has absolutely go out versus no	176 (35.1%)	14.93 (4.89)	0.193
Applies social distancing versus no	142 (39.3%)	15.15 (4.72)	0.003[a]
I was licensed from work versus no	16 (4.4%)	12.60 (4.73)	0.086
Job cannot be done from home versus no	70 (13.9%)	14.22 (4.76)	0.457
Current position after COVID crisis[b]			
Works on his/her own versus no	125 (34.7%)	14.08 (4.28)	0.113
Owns an enterprise versus no	87 (24.0%)	13.95 (4.53)	0.144
Managerial position versus no	145 (40.1%)	15.07 (4.89)	0.119
Employee versus no	205 (56.7%)	14.67 (4.89)	0.731
Looking for a job versus no	50 (13.9%)	12.77 (4.66)	0.009[a]
Change since economic crisis			0.001
No change	135 (37.4%)	15.51 (4.81)	Ref
Permanent closure	11 (3.05%)	12.00 (3.98)	0.013
Temporary closure	53 (14.7%)	14.07 (4.38)	0.020
Work from home	20 (5.5%)	12.86 (4.42	<0.001
Decrease shifts	80 (22.2%)	14.59 (4.43)	0.070
Does not apply	61 (16.9%)	14.09 (5.25)	0.039
Change since COVID crisis			

(continued)

Table 3. (continued)

Characteristic	Frequency (%) *N* = 361 (100%)	Unadjusted MWB mean (*SD*)	*p*-value
No change	46 (12.7%)	16.31 (5.80)	0.343
Permanent closure	21 (5.8%)	13.94 (3.96)	
Temporary closure	63 (17.5%)	14.35 (4.08)	
Work from home	79 (21.9%)	14.00 (4.50)	
Decrease shifts	106 (29.4%)	14.43 (4.60)	
Does not apply	46 (12.7%)	14.94 (5.37)	
Current personal income change			
No change in income	152 (42.1%)	15.29 (5.03)	0.310
Decrease by 25%	48 (13.3%)	14.76 (5.18)	
Decrease by 50%	77 (21.3%)	13.94 (4.63)	
Decrease by 75%	53 (14.7%)	13.39 (3.23)	
Temporary no salary	22 (6.1%)	13.76 (3.80)	
Was licensed	9 (2.49%)	14.97 (5.21)	
Current enterprise salary change			0.050
No change in salaries	153 (42.4%)	15.40 (5.34)	Ref
Decrease by 25%	58 (16.1%)	13.63 (4.23)	0.007
Decrease by 50%	74 (20.5%)	13.90 (3.89)	0.036
Decrease by 75%	13 (3.6%)	13.31 (4.97)	0.138
Temporary no salary	14 (3.9%)	14.83 (5.24)	0.509
Does not apply	49 (13.6%)	14.57 (4.12)	0.588
Current enterprise employees licensing			0.004[a]
No change	231 (64.0%)	15.11 (4.92)	Ref
Licensing by 25%	36 (10.0%)	13.54 (4.21)	0.067
Licensing by 50%	19 (5.3%)	12.44 (4.63)	0.005
Licensing by 75%	7 (1.9%)	11.05 (3.16)	0.037
Licensing all employees	7 (1.9%)	17.59 (3.95)	0.165
Does not apply	61 (16.9%)	13.95 (4.16)	0.130
	Mean (*SD*)	Unadjusted correlation (r)	*p*-value
Years of experience	16.81 (10.30)	−0.032	0.556
Years current position	12.88 (10.19)	−0.020	0.347
Worry that the crisis would affect the job	7.80 (2.51)	−0.206	<0.001[a]

[a]Statistically significant result.
[b]More than one option is possible.

lower MWB, whereas physical exercise was shown to have the highest positive impact on MWB. Fear of COVID-19 lost its significance in the workers' group.

Regarding the economic factors, and although "economic damage" can only be assessed when the pandemic subsides (Yamin, 2020), financial loss creates long-lasting

Table 4. COVID-19 Exposure, Health Characteristics, and MWB.

Characteristic	Frequency (%) *N* = 502(100%)	Unadjusted MWB mean (*SD*)	*p*-value
Had COVID-19 infection			
Yes	3 (0.6%)	14.77 (2.32)	0.990
No	499 (99.4%)	14.80 (4.94)	
Contact with COVID-19			
Yes (work, family, store)	18 (3.5%)	16.11 (4.26)	0.257
No	484 (96.5%)	14.76 (4.95)	
Knows someone infected			
Yes	145 (28.8%)	15.27 (4.57)	0.164
No	357 (71.2%)	14.62 (5.06)	
Visiting/receiving friends			
Yes	109 (21.8%)	15.08 (4.46)	0.517
No	393 (78.2%)	14.73 (5.06)	
Visiting/receiving family			
Yes	311 (61.9%)	14.52 (4.73)	0.103
No	191 (38.1%)	15.26 (5.22)	
Physical activity			
Yes	321 (64.0%)	15.23 (4.93)	0.010[a]
No	181 (36.0%)	14.05 (4.85)	
Chronic disease			
Yes	103 (20.5%)	13.90 (4.96)	0.036[a]
No	399 (79.5%)	15.04 (4.90)	
Regular treatment			
Yes	127 (25.4%)	13.67 (4.77)	0.009[a]
No	40 (8.0%)	15.99 (5.19)	
Does not apply	334 (66.6%)	15.09 (4.90)	
Fear no access to treatment			
No	153 (30.5%)	16.03 (4.85)	<0.001[a]
Yes	136 (27.0%)	13.14 (4.59)	
Does not apply	213 (42.4%)	14.98 (4.93)	
Fear to go get treatment			
No	217 (43.2%)	15.09 (4.98)	0.003[a]
Yes	77 (15.4%)	13.16 (4.77)	
Does not apply	208 (41.4%)	15.12 (4.85)	
Family member has chronic disease			
No	199 (39.6%)	14.96 (4.84)	0.605[b]
Yes	261 (52.1%)	14.72 (4.99)	
Does not apply	42 (8.3%)	14.55 (5.06)	
Worried family member			

(continued)

Table 4. (continued)

Characteristic	Frequency (%) *N* = 502(100%)	Unadjusted MWB mean (*SD*)	*p*-value
No	96 (19.1%)	15.15 (4.80)	0.204[b]
Yes	268 (53.4%)	14.40 (5.02)	
Does not apply	138 (27.4%)	15.35 (4.81)	
	Mean (*SD*)	Unadjusted correlation (*r*)	*p*-value
Fear of COVID-19	11.35 (6.03)	−0.228	<0.001

[a]Statistically significant result.
[b]Yes versus no modalities comparison.

socioeconomic distress with anger and anxiety that can last months after the pandemic. A report from The World Bank (2020) pointed out a substantial impact of COVID-19 on the Lebanese economy (11% decrease in GDP in 2019), especially with uncertainties about the duration of the pandemic and the drastic changes in the financial system (Brooks et al., 2020). In such a vulnerable system, workers were highly preoccupied with the wilting economy and outcomes of lockdown on their employment rather than fearing the virus itself. In this context, fear of poverty, illustrated by the subjective economic assessment that shows a significant shift towards low and below poverty classes, would reveal the direct impact of challenging financial situations on the population's MWB. Prior to the COVID-19 outbreak, the World Bank had forecasted that, by 2020, the proportion of Lebanese below the poverty line would increase from 30 to 50% (The World Bank, 2019b).

Regarding the group of workers, individuals owning their businesses before the crisis, working from home since the beginning of the economic crisis, and worrying about the long-term effect of the crisis on their employment status experienced the worst MWB. The main impact was directly related to worrying about their work: those who worked remotely from home feared a wage cut-down or even dismissal if the situation persisted. Business owners feared a complete collapse in income in the absence of governmental financial support since budgetary policies are lacking in Lebanon (Brooks et al., 2020). Another significant aspect is the level of education. Our results showed that the higher the level of education, the lower the MWB. Expectedly, being unable to plan or face unforeseen expenses or overcome any sudden deterioration in the economic environment affects people's MWB. Therefore, in our study, participants holding university degrees might have felt deceived, disappointed, and worried about their future in Lebanon due to the current challenging context.

Unlike what was reported by working participants, unemployed respondents (retired, students, and housewives) worried more about contracting the virus. This fear associated with COVID-19 has been widely reported in the literature and might be related to the worry that the healthcare system might be saturated, leading to inadequate

Table 5. Multivariable Analyses: Correlates of WHO-5.

Model	Unstandardized B	Standardized beta	*p*-value	95% CI of unstandardized B
Correlates of WHO-5 (all sample)[a]				
APGAR score	0.380	0.210	<0.001	0.235; 0.525
Fear of poverty score	−0.232	−0.125	0.007	−0.402; −0.063
Verbal violence in the home	−3.464	−0.166	<0.001	−5.137; −1.790
Fear of COVID score	−0.131	−0.161	<0.001	−0.199; −0.063
Female gender	−1.533	−0.155	<0.001	−2.324; −0.743
University education	−2.119	−0.137	0.001	−3.353; −0.885
Chronic disease	−1.307	−0.107	0.009	−2.283; −0.330
IFDFW financial wellness score	0.029	0.102	0.027	0.003; 0.055
Correlates of WHO-5 (Workers)[b]				
Female gender	−1.516	−0.813	0.001	−2.429; −0.603
University education	−2.806	−0.788	0.002	−4.552; −1.060
Verbal violence in the home	−2.579	−0.055	0.027	−4.866; −0.292
Waterpipe current versus previous	3.079	0.566	0.024	0.412; 5.747
Waterpipe sometimes versus previous	2.426	0.498	0.046	0.039; 4.813
Waterpipe none versus previous	2.297	0.503	0.044	0.061; 4.533
Physical activity	1.318	0.681	0.006	0.370; 2.265
Chronic disease	−1.411	−0.595	0.017	−2.573; −0.249
Having its own work before crisis	−1.220	−0.605	0.016	−2.208; −0.231
Work from home versus no change	−1.853	−0.494	0.048	−3.692; −0.013
Temporary closure of institution	−1.201	−0.419	0.094	−2.607; 0.204
IFDFW financial wellness score	0.041	0.063	0.013	0.009; 0.072
APGAR score	0.604	0.892	<0.001	0.447; 0.760
Worried about employment status	−0.433	−0.976	<0.001	−0.650; −0.216
Fear of COVID score	−0.054	−0.325	0.192	−0.136; 0.027

[a]Stepwise Likelihood ratio method; linear regression, assumptions checked. Included in first step: Age, gender, education, alcohol, cigarette, waterpipe, verbal violence, APGAR score, fear of poverty score, IFDFW, physical activity, chronic disease, fear of COVID score.

[b]ENTER method; linear regression using GEE, assumptions checked; Included in first step: Age, gender, education, alcohol, cigarette, waterpipe, verbal violence, APGAR score, fear of poverty score, IFDWF, physical activity, chronic disease, fear of COVID score; working on its own, being jobless, professional change since the crisis started; salary changes in the enterprise, licensing employees in the enterprise, worrying about long-term crisis effects on its job.

management of COVID-19 patients (Coelho et al., 2020; Thombs et al., 2020). It could also be related to their fear of not being able to afford the treatment in difficult financial situations, as is the case in Lebanon.

Besides the economic factors, some sociodemographic features were also identified as predictors of MWB of Lebanese people. Lower MWB was associated with the female gender, having a chronic disease, and experiencing verbal violence at home, whereas better family satisfaction was correlated with a better MWB. These associations can be explained by homeschooling led by mothers (Wenham et al., 2020) and forced confinement with a violent partner (Bradbury-Jones & Isham, 2020; Chandan et al., 2020; Mittal & Singh, 2020), while family support improves MWB (Coelho et al., 2020; Zhang & Ma, 2020). Several studies highlighted that family support was a crucial protective factor associated with well-being, especially among students, since families allowed better coping strategies with detrimental outcomes related to the pandemic (Ellis et al., 2020; Zsido et al., 2022). Furthermore, a systematic review evaluating the impact of the COVID-19 pandemic on mental health outcomes, including MWB, concluded that lower psychological well-being was noted among females and those who self-reported poor health (Vindegaard & Benros, 2020). Vulnerable people, particularly those with chronic illnesses, require special attention. Around 20% of our respondents had a chronic disease and exhibited a lower MWB in the whole group and the workers' subgroup. Lebanon has high percentages of vulnerable populations considered at higher risk for COVID-19 and lower MWB (Megari, 2013; Vindegaard & Benros, 2020). Reasons in this context could include panic due to unreliable information for patients (Hayek et al., 2020), especially in an era of massive misinformation in the media (Cuan-Baltazar et al., 2020; Park et al., 2020), added to the economic situation itself. Furthermore, the healthcare system in Lebanon is mainly private, while 10.5% of our population reported not having any health coverage. Consequently, patients with chronic diseases might fear not being able to afford medications and medical care, especially with the significant drop in the sizes of the wealthy and middle classes, in favor of a significant increase in poor and below poverty classes, as demonstrated by our results.

Finally, two lifestyle factors were shown to have a significant and positive impact on the general MWB of the population, i.e., smoking status and physical activity, particularly in the subgroup of workers, who reported an increase in the time allocated for exercise (30%). Several reports have been published recently regarding the importance of physical exercise as a therapy to fight the mental and physical consequences of COVID-19 lockdown (Fallon, 2020; Jimenez-Pavon et al., 2020). Physical activity and exercise also help maintain immune system function in the current precarious environment and are particularly recommended in vulnerable populations such as those with chronic diseases (Chen et al., 2020), who had lower MWB scores in our study.

Regarding smoking, current smokers expressed a better MWB versus previous smokers. In Lebanon, behavioral/motivational factors for smoking cessation are mainly driven by health-related issues. Thus, this particular population of "previous smokers" might be at higher risk of vulnerability and chronic diseases (including pulmonary

diseases), exposing them to lower MWB scores (Salameh et al., 2008). The positive correlation among current waterpipe smokers (regular and occasional) might seem surprising since tobacco exposure is known to be a prominent risk factor for decreased MWB, particularly in cases of chronic respiratory disease (Salameh et al., 2008). However, smokers might have felt some relief, reducing their stress and anxiety towards hardship, through the already known "self-medication" hypothesis of smoking, postulating that individuals turn towards smoking to cope with stress and alleviate their depression and anxiety symptoms (Bahelah et al., 2019; Chaiton et al., 2009; Fluharty et al., 2017). This reason is added to the specificities of waterpipe smoking (positive and negative reinforcement, social aspect, and conviviality) (Bahelah et al., 2019; Salameh et al., 2008).

Overall, our results are compatible with the biopsychosocial model used to generate the hypotheses and build the questionnaire. Indeed, Lebanese mental well-being was related to biological characteristics (chronic disease and family history of COVID-19), behavioral/psychological factors (health beliefs such as the fear of COVID-19), and social conditions (family relationships, education, economic status, and social support) (Babalola et al., 2017).

Limitations and Strengths

Our study has some limitations. Although our sample was weighted for gender, age, and regions, it mainly consisted of people with a university level of education with high computer literacy; thus, our results might not be generalized to the whole population. This outcome was expected since the survey used was online, and only computer literate people with Internet access were able to participate. However, this selection bias is not expected to affect the associations found in the multivariable analysis since the education factor was taken into account as a potential confounder, and all results were adjusted over the education factor. Moreover, although the questionnaire was piloted to improve its clarity, there is a probability of information bias since the questionnaire was self-administered online, with no possibility to explain confusing questions to respondents, if any; however, the use of an online questionnaire is expected to decrease the subjectivity related to interviews. Furthermore, recalling difficulty and subjectivity bias related to some questions are also plausible. In all cases, the non-differential information bias would drive the results towards the null hypothesis, thus underestimating the real associations. An additional potential bias would be the residual confounding since not all confounders could be measured.

Nevertheless, and despite these limitations, to the best of our knowledge, this is the largest (sample size large enough to account for statistical power of main comparisons) and the first study evaluating the combined effect of the COVID-19 pandemic and the economic crisis on the MWB in the general population. Moreover, a standardized questionnaire with validated scales was used to evaluate MWB, economy or COVID-19-related factors. Finally, our study pilot-tested the validity of the questionnaires, and all used scales have shown very good to excellent reliability.

Conclusion

This study revealed that, during the pandemic, economic and other factors, directly or indirectly related to COVID-19, significantly affected mental well-being. The fear of COVID-19 and fear of poverty mainly impacted the MWB of the general population. However, the fear of COVID-19 lost its significance among workers who reported that factors negatively affecting their MWB are directly related to their employment and the already collapsing economy in Lebanon.

Decision-makers should acknowledge that economic hardship can outweigh the fear of COVID-19 in terms of mental well-being. This finding leads to the hypothesis that people would relieve their stress through economic activity rather than respecting COVID-19 restrictions, which may increase the risk of contracting the infection. Further research is necessary to confirm this paradigm.

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Authors' Contribution

Hala SACRE: Conceptualization, Writing - Original Draft, Writing - Review and Editing, Project administration. Aline HAJJ: Writing - Original Draft. Danielle A. BADRO: Writing - Original Draft. Carla ABOU SELWAN: Writing - Original Draft, Writing - Review and Editing. Randa AOUN and Chadia HADDAD: Writing - Review and Editing. Pascale SALAMEH: Methodology, Formal analysis, Visualization, Supervision.

Declaration of Conflicting Interests

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Ethics Approval

The study protocol was approved by the Institutional Review Board of the American University of Science and Technology approved (IRB application number AUST-IRB-20,200,527–01).

Consent to Participate

The topic was explained to all participants in the introductory section of the survey and consent to participate was implicit. Anonymity of participants was guaranteed throughout the process of data collection and analysis

Availability of Data and Materials

The datasets used and/or analyzed during the current study are available from the corresponding author upon reasonable request.

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Randa Aoun has a PharmD degree from the Saint-Joseph University of Beirut (USJ), Lebanon. She is currently the Corporate Affairs and Market Access Director at Pharaon Companies, part of Holmed Group. She has excellent communication and technical skills. She performs confidently and effectively under pressure and thrives on challenges.

Randa was a very active member-elect of the Order of Pharmacists of Lebanon (OPL), where she filled many managerial positions during two mandates, including vice-president (2007-2009) and Chair of the scientific committee (2009-2015). Randa is a Regulatory Affairs and Market Access expert and an adjunct professor of Regulatory Affairs at the Faculty of Sciences, USJ-Lebanon.

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