

A cross-sectional study assessing the alarming prevalence of burnout among physicians in a developing country facing a combination of a COVID-19 Pandemic and an economic collapse

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Abstract

Background:

Burnout among physicians is a serious concern that cultivates its seeds during their education and matures in their daily practicing life. Lebanese physicians were particularly at high risk of burnout since they confronted a mixture of overlapping crises.

Objectives:

This study aimed to assess the prevalence of burnout among Lebanese physicians, to investigate its associated factors and to explore the combined effects of the pandemic and the economic crisis on burnout.

Methods:

A web-based cross-sectional study was conducted among Lebanese physicians over December 2020 using a snowball sampling technique. Self-reported data were collected electronically through an anonymous questionnaire that included information on socio-demographic characteristics, work-related variables, and 4 scales: fear of COVID-19, threat perception, InCharge Financial Distress/Financial Well-Being, and the Copenhagen burnout inventory (CBI). CBI scale cut-off score of 50 was used to evaluate the prevalence of burnout. Multivariable linear regression analyses were carried out to identify the factors associated with burnout.

Results:

A total of 398 physicians participated in the study. The majority of them were male (52.8%), married (60.1%), and aged between 40 and 49 years (43.2%). Burnout hits 90.7% of the Lebanese physicians where personal, work-related, and client-related burnout were detected among 80.4%, 75.63%, and 69.6% of them respectively. A strong association was found between the higher level of burnout and female gender, younger age, being single, having a dependent child, living with an elderly or having a family member with comorbidities, and insufficient sleeping hours. Physicians' specialties, working in a public health facility, limited years of professional experience, lack of previous experience in pandemic and extensive working hours were also associated with increased burnout. Furthermore, low income, working in the frontline, higher threat perception, and fear of COVID-19 were contributing to higher burnout. However, financial wellbeing, altruism, having good health, and previous history of COVID-19 were significantly associated to lower burnout. The combined effect of threat perception and financial hardship significantly increased the level of burnout.

Conclusion:

The huge burnout level among Lebanese physicians raises alarm about the seriousness of the current situation and urges the health authorities to take prompt action to enhance the physicians' wellbeing.

Background:

In recent years, burnout syndrome has been a major concern widely discussed in the area of occupational health [1, 2]. It is described as a state of psychological exhaustion resulting from extended exposure to a stressful work environment [3]. It may occur in a very wide range of work contexts, and in particular in demanding jobs that require excessive personal interactions with other people (colleagues, patients...) such as healthcare providers [4–6]. Owing to their commitment to serve and to care for patients, healthcare workers (HCWs) belong to the most devoted servants to humanity which gives them a lifetime professional gratification resulting from such dedication [7, 8]. However, healthcare was listed among the top high-stress professions that provoke a high level of burnout [4]. Many studies conducted throughout the previous decades on the extent of burnout among HCWs found that despite the variation of the extent of burnout among healthcare professions, all medical staff including physicians [9, 10], pharmacists [11], nurses [12, 13], and lab technicians [14].

Of note, physicians are among the top potential candidates for burnout [15]. It is worth mentioning that burnout among physicians begins to cultivate its seeds during their education period, goes along with the residency, and finally matures and crowned the daily practicing life [16–18]. This could be related to the fact that physicians are exposed to high levels of distress at work resulting from persistent tension, extensive working hours, a wide range of tasks, and dealing with patients, their families, and other colleagues [19, 20]. They also deal regularly with several complex situations, including responsibility for the health and wellbeing of patients, high expectations, patients' and families' aggressive behaviors and complaints, and coping with death and injury [21–23]. Physicians who encounter the issues above are more likely to have psychological and physical exhaustion which employees become cynical about their work and experience [24–26].

Several studies conducted prior to the COVID-19 pandemic have indicated a high prevalence of burnout among practicing physicians and have shown that have experienced burnout at certain points throughout their careers [27]. The worldwide prevalence of burnout among physicians varies from one country to another, ranging from 3.7–54.1% [28–30]. In Arab countries, the prevalence of overall burnout among physicians ranged from 12.6–41.94% [31]. Another study estimated that one in every three physicians will suffer from burnout at a given time [32, 33]. It is worth mentioning that burnout among physicians could be considered an epidemic with devastating personal and professional consequences and incite physicians towards turnover, early retirement as well as

poor job performance [34, 35]. In addition, it can also negatively impact the quality of care provided to patients by diminishing empathy toward patients hence increasing the risk for medical errors and eroding their professionalism [36–38].

In a world facing the COVID-19 pandemic, the prevalence of burnout among physicians is snowballing since they experienced ever-increasing pressure in their daily lives, particularly at their work [39–41]. This upsurge was reported in numerous studies conducted worldwide [42]. Similar to other countries, Lebanon experienced many challenges imposed by the COVID-19 pandemic on its healthcare system which was already in a fragile state even prior to the pandemic [43], the economic collapse [44], and the Beirut blasting [45]. It was overwhelmed by the humanitarian crisis revealed by the influx of more than one million Syrian refugees making the country home to the highest number of refugees per capita in the world [46]. However, the COVID-19 pandemic overlapped with an economic crisis that has its roots in the aftermath of the civil war goaded by corruption and mishandling of the country's resources [47]. This economic crisis was ranked by the World Bank among the world's three worst crises since the mid-1800s affecting living standards where the Lebanese pound has lost more than 90% of its values since fall 2019 [48]. This was later followed by the devastating Beirut blast, one of the most powerful non-nuclear explosions in the history of the world which was coupled with a meteoric soar in infections and hospitalizations where ICU occupancy in the hospitals touched 95% in January 2021 [49]. Physicians, among other HCWs, bear the large toll of the pandemic [50]. The growing number of physicians diagnosed with COVID-19 unveiled gaps in policies and laws intended to warrant physician safety such as coverage for healthcare, disability, and death [51]. As a result of these consecutive and combined events, Lebanese physicians suffering from burnout and economic depletion are leaving to find a better life elsewhere [52]. In such a typical context of multiple calamities that fueled mental health problems and burnout; it is of great interest to assess the level of burnout among Lebanese physicians and to understand its determinants in order to prevent and reduce such syndrome and to stop the forced immigration of the healthcare human assets. Of note, concerns about pandemic (Shuja et al., 2020) [53] and financial wellbeing (Cooper, 2011) [54] could both instigated psychological illnesses and could interact and increase the level of burnout among physicians.

The present study aims to assess the prevalence of burnout levels among Lebanese physicians stranded among the mixture of crises, along with how sociodemographic factors, work-related factors, economic factors, and pandemic-related factors affect the intensity of burnout. Besides, we targeted to assess the combined effects of the COVID-19 pandemic and economic crisis on burnout among Lebanese physicians.

Methods:

Study design and population:

A quantitative cross-sectional study enrolled 398 Lebanese physicians practicing in all active hospitals located in the eight Lebanese provinces. It was conducted over December 2020. In compliance with social distancing restrictions, participants were electronically invited to participate. A snowball sampling technique was used to select participants from all Lebanese governorates (Bekaa, Baalbeck-Hermel, South, Nabatyeh, Akkar, North, Beirut, and Mount Lebanon). Participants were identified via professional groups and health facilities.

Physicians working in health facilities were contacted via phone call and notified about the survey and its purpose. Upon their agreement to participate, an online questionnaire using a Google form was sent to them via emails or WhatsApp as per their preference. They were invited if possible to disseminate the link of the survey among their colleagues. The link of the study included a brief explanation of the study and the objective of the survey, in addition to specific instructions for filling the questionnaire. All practicing physicians of either gender currently working in active hospitals and who had access to the internet were eligible to participate in this study. This study excluded physicians who are not practicing currently, those who were out of the country at the time of the survey, retired physicians, trainees of residency programs, interns, and those who refused to give informed consent. Since the study has no foreseeable risks, written consent was obtained in an electronic format. No reward was received by respondents in return for participation. All methods were performed following the relevant guidelines and regulations.

Sample size calculation

Using an estimated population of 10,918 physicians [55], an expected response of 50%, a 95% confidence level and an estimated absolute error of 5%, the requisite sample size was calculated using the RAOSOFT digital sample size calculator. All previous information were used to calculate the sample size for this study which yielded the least required sample size of 372 participants which was achieved at an early stage of the study before the closure of response acceptance (January 1st, 2021). Of note, the achieved sample size was 398 physicians.

Ethical consideration

Written informed consent was obtained for each participant. They were reassured that the participation is voluntary and that they were free to withdraw at any time. In addition, all information were gathered anonymously and handled confidentially. The study design assured adequate protection of study participants and do not imply any risk for them. None of the survey questions asked for information that could harm the participant in any way.

Instrumentation:

A questionnaire was developed in the Arabic and the English languages through an online platform via Google forms. The utilized scales used were translated into Arabic, except for the CBI-A already validated and available in the Arabic language (Youssef et al. submitted) following the guidelines for forward and backward translation. A consensus was used to resolve inconsistencies between the original and translated versions. A pilot survey was also conducted on 15 physicians, and some reformulations for some questions were made throughout its course. The answers to the pilot survey were excluded from the final data of this study. The finalized anonymous, self-administered questionnaire was comprehensible and took 10 to 13 minutes to complete. The questionnaire included mainly closed-ended questions. It consisted of four sections: (a) introduction and informed consent (b) basic sociodemographic characteristics, (c) work-related and exposure to COVID-19 variables, and (d) the measurements

The first section consisted of a brief introductory paragraph stating the aims of the study, declaration of anonymity and confidentiality, and mandatory informed consent followed by the items of the survey. The second section collected sociodemographic data of the participants, including gender, age, marital status, specialty, urbanicity, health status, and living conditions. It also included questions about the history of medical illnesses and the health status of people living with the participant. Participants were also asked about the type of health facility and its geographical location. The third section covered the topic of exposure to COVID-19 in addition to work-related variables. Physicians were queried to answer on whether they have worked in the frontline, treating or caring for COVID-19 patients, (b) been tested for COVID-9 (c) been diagnosed as COVID19 case, (d) had a family member relative or colleague infected by COVID-19. Each of these variables was answered on a yes or no basis.

The fourth section consisted of 4 validated scales to objectively assess financial well-being, threat perception, fear of COVID-19, and burnout among the participants. The scales were used after requesting permission from their copyright owners when required.

1-The perceived threat and altruistic acceptance of risk questionnaire:

This tool was developed by Chong et al to assess the risk perception of COVID-19 among HCWs, the perceived threat questionnaire [56]. It consisted of 10 items where nine of these items described HCWs' perception toward COVID-19 threat and one item related to altruistic acceptance of COVID-19 risk. Ratings were given based on a five-point Likert scale (1=strongly disagree, 2= disagree, 3 = neutral, 4=agree, 5=strongly agree). Responses were dichotomized into positive responses 'agree' or 'strongly agree', while 'strongly disagree', 'disagree', and 'not sure' were considered negative. The Cronbach alpha of this scale was equal to 0.703.

2-The fear of COVID-19 scale:

This tool that consisted of 7 items was developed by Ahorsu et al., 2020 [57] to assess the extent of fear of the COVID-19, scored on a 5-point Likert scale from 1 (strongly disagree) to 5 (strongly agree). The total score is calculated by summing the answers to all questions and ranges from 1 to 35. Higher scores point out a large extent of fear from COVID-19 infection. The Cronbach's alpha for this scale was 0.769.

3- The InCharge Financial Distress/Financial Well-Being scale (IFDFW)

This tool was developed by Prawitz et al., 2006 [58] including eight items measuring the perceived financial distress/financial well-being on a linear scale from 1 to 10. Higher scores reflect lower financial distress and higher well-being. The Cronbach's alpha for this scale was 0.85 [59]. Permission was requested from the authors to use it in our study.

4- The Arabic version of Copenhagen Burnout scale A-CBI:

The validated Arabic version of the CBI that consisted of 19 items was used (Youssef et al. submitted). It evaluates personal-related (6 items), work-related (7 items), and client-related (6 items) burnout. Participants were asked to rate how often they felt exhausted. Ratings were given based on a five-point Likert scale. Each item was scored from 0-100 (0=never, 25= Seldom, 50 = Sometimes, 75= Often, 100= Always). Of note, some questions were answered using another five-point Likert scale (to a very high degree, to a high degree, somewhat, to a low degree, to a very low degree). Mean items score was calculated per scale. Each scale score depicts the direction indicated by its name. A cut-off of 50 was used to assess the prevalence of burnout among physicians. A score of more than 50 is considered high burnout level whereas a score less than 50 signify a low burnout level. The score was valid and reliable according to many previous studies [59]. In our study, the Cronbach's alpha of this scale was equal to 0.879. In fact, the questions of CBI are mixed with questions on other topics in order to avoid stereotyped response patterns. Of note, a reverse coding was performed to item number 7 "Do you have enough energy for family and friends during leisure time" in the work-related burnout score.

Statistical analysis:

The generated data on an excel spreadsheet was transferred to the statistical software IBM SPSS® software (Statistical Package for Social Sciences) version 24.0 for analysis. Given that the response to the majority of questions was mandatory, the missing data constituted < 10% of the total database, then it was not substituted. For descriptive analysis, frequency and percentage were used for categorical variables, the mean and standard deviation for quantitative variables. The normality distribution of CBI scale items was confirmed by calculation of skewness and kurtosis values which are lower than 1 [60]. The Student's T-test was used to compare the means between 2 groups whereas one-way analysis of variance ANOVA to compare between three groups or more, after checking for homogeneity of variances. A Spearman's correlation was applied to link used scores with burnout subscales. To estimate effect size, the Eta squared was used to compare means. All variables that showed a p-value< 0.2 in the bivariate analysis were included in the multivariable analysis as an independent variable. Four linear regressions using the stepwise method were conducted to identify the correlates of each of the CBI scales, after checking the absence of multicollinearity. P< 0.05 was considered statistically significant. To assess the interaction between the threat perception and the financial wellness (IFDFW) scales, the estimated marginal means were calculated for burnout among subjects according to their perception of COVID-19 threat and IFDFW (high/low categories).The dichotomization of the two variables (perception of threat and IFDFW) into high and low categories was done according to the median of each scale.

Results:

Baseline information of the participants:

A total of 398 physicians participated in the survey. Table 1 displayed the baseline characteristics of the surveyed physicians. The majority of them were male (52.8%); married (60.1%), aged between 40-49 years old (43.2%), and residents of Mount-Lebanon province (34.7%). Around half of participants had currently a dependent child (47.7%) or were living with the elderly (53%) or a family member with comorbidities at home (53.8%). More than two-thirds (69.85%) of

surveyed physicians had a professional experience larger than 10 years and a previous experience in working in pandemic or emergency incidents (74.12%). The highest percentage of respondents were working in the frontlines (62.1%) and 51.9% of them were caring of COVID-19 cases. Only 15.3% of them had a previous history of COVID-19. However, 44.2% of the participants had a family member diagnosed with COVID-19 and 90.2% of them had a colleague diagnosed with COVID-19. Of note, the majority of surveyed physicians (39%) were specialized in internal medicine. Figure 1 detailed the specialties of the surveyed physicians.

Table 1
Socio-demographics characteristics of surveyed physicians (N=398)

	n	%
Gender		
Male	210	52.80%
Female	188	47.20%
Age (years)		
Less than 40 y	143	35.90%
40-49 y	172	43.20%
≥50 y	83	20.81%
Marital status		
Single	152	38.20%
Married/Engaged	239	60.10%
Other (Divorced or Widowed)	7	1.80%
Residence		
North & Akkar	66	16.60%
Mount Lebanon	138	34.70%
Beirut	105	26.40%
South & Nabatyeh	45	11.30%
Bekaa & Baalbeck-Hermel	42	11.00%
Working experience		
Less than 10 years	120	30.15%
10 years and more	278	69.85%
Previous experience in Outbreak/Pandemic/Emergency		
No	103	25.88%
Yes	295	74.12%
Health facility type		
Public	133	33.40%
Private	265	66.60%
Presence of child at home		
No	208	52.30%
Yes	190	47.70%
Presence of elderly people at home		
No	211	47.00%
Yes	187	53.00%
Living with family member with comorbidities		
No	184	46.20%
Yes	214	53.80%
Working in frontline in the response to COVID-19		
No	151	37.90%
Yes	247	62.10%
Following up or caring of COVID-19 case		
No	191	48.10%
Yes	207	51.90%

	n	%
Personal history of COVID-19 diagnosis		
No	337	84.70%
Yes	61	15.30%
Family member/friend or colleague ever diagnosed with COVID-19		
No	222	55.80%
Yes	176	44.20%
Colleague ever diagnosed with COVID-19		
No	39	9.80%
Yes	359	90.20%
<i>Note: n: Frequency, % Percentage,</i>		

Description of the scales:

In this sample of physicians, burnout, as measured by the CBI, had a mean of 65.34 (SD=17.39) while the values for threat perception scale, FOC scale, and IFDFW were 35.53 (SD=2.88), 17.88(SD=1.4), and 22.85 (SD=7.64) respectively. The normality of the all used scales was assumed since skewness and kurtosis were lower than 1 for all, and the sample size larger than 300. All the used scales showed good reliability; IFDFW ($\alpha = 0.85$); FOC ($\alpha = 0.769$); threat perception ($\alpha = 0.703$) and CBI ($\alpha = 0.879$). The lower scores of IFDFW reported in all items of the scale reflected higher financial distress and lower well-being. The highest burnout level was shown in the dimension related to work (71.5±16.33) followed by the one related to personal burnout (64.8±17.32). A detailed description of the scales is presented in Table 2.

Prevalence of burnout among Lebanese physicians

Using a cut-off of 50 for CBI, burnout was detected among 90.1% of surveyed physicians, where 71.6% had a moderate burnout and 19.1% had a high level of burnout. Personal burnout (PB) ranked first among other burnout aspects, where we can found that 80.5% of physicians suffered from PB with 45.8% of them reported high levels. As for work-related burnout (WB), it was detected among in its moderate and high level among more than three-quarters of physicians (75.6%), where 60.3% of them exhibited a high level of WB. In regards to client-related burnout (CB), it was noticed among 69.6% of respondents (Figure 2).

Socio-demographic characteristics and burnout

For the overall burnout scale, female gender, younger age, being single or divorced, and physicians who had a dependent child and those who live with elderly and family members with comorbidities had a significantly higher level of burnout. Similarly, all these sociodemographic variables were significantly associated with a high level of personal burnout, work-related burnout, and client-related burnout except the age which was not significantly associated with the work-burnout dimension. On other hand, residency of the physician was found to be not significantly associated with overall burnout and either of its subscales. The largest effect size was observed in age, marital status, and presence of a dependent child at home (Table 3).

Economic characteristics and burnout

Surveyed physicians who subjectively classified themselves as having currently a low socioeconomic status following the COVID-19 pandemic and the economic crisis had significantly higher burnout in all its aspects (personal, work, and client-related burnout. In addition to those currently labeling themselves in this category, physicians earning less than 2 Million Lebanese lira per month had also a high level of burnout. Similarly, physicians who considered that pandemic or economic crisis highly impacted their monthly income had higher burnout levels, while those who perceived the minor impact of the pandemic and the economic collapse had the lowest burnout level. Having private health coverage was associated with a higher burnout level of burnout, while financial well-being was negatively correlated with high burnout. Regarding stress, the largest effect size was seen in low economic status after the COVID19 pandemic and economic crisis, major impact of the economic crisis on the income and financial well-being (Table 4).

Occupational factors and burnout

Table 5 displayed the association between occupational factors and burnout subscales. As for occupational factors, physicians who practiced in public hospitals had significantly higher levels of burnout. The increase in anxiety was similar, whether due to the economic situation or to the COVID-19 crisis. Those who have working professional experience of fewer than 10 years and those who lacked previous experience in working during pandemics or emergencies had significantly higher levels of burnout compared to those who had large work experience and had practiced during a previous pandemic. Participants whose enterprise temporarily closed and whose income decreased by 75% had significantly higher mean anxiety scores. Furthermore, insufficient sleeping hours and extensive working hours increased the overall burnout among respondents. Finally, physicians who considered that the pandemic has a major impact on their work had significantly higher burnout. However, the location of the hospital didn't affect the level of burnout. Sleeping hours, extensive working hours, and the major impact of the pandemic on workload had a large effect size related to the overall burnout. Similar occupational factors were associated with a high Level of BP except for extensive working hours. In addition to previously identified professional factors increasing the level of burnout among physicians, physicians working in hospitals located in urban areas had higher work-related burnout. In terms of client-related burnout, a higher level among physicians was found to be associated with health facility type, previous experience during a pandemic, and extensive working hours (Table 5).

Table 2
Descriptive statistics of the scales used in the study

#	Scale items	Mean	S.D
IFDFW	InCharge Financial Distress/Financial Well-Being Scale($\alpha = 0.85$)	22.85	7.64
IFDFW1	What do you feel is the level of your financial stress today?	2.98	1.48
IFDFW2	How satisfied you are with your present financial situation.	2.78	1.26
IFDFW3	How do you feel about your current financial situation?	2.81	1.41
IFDFW4	How often do you worry about being able to meet normal monthly living expenses?	2.94	1.47
IFDFW5	How confident are you that you could find the money to pay for a financial emergency	3.16	1.58
IFDFW6	How often do you want to do something (eating outside, vacation, watching movie, practicing a hobby....) and don't go because you can't afford to?	2.49	0.94
IFDFW7	How frequently do you find yourself just getting by financially and living paycheck to paycheck?	2.69	1.22
IFDFW8	How stressed do you feel about your personal finances in general?	3.00	1.48
FOC	Fear of COVID19 ($\alpha = 0.769$)	17.88	1.4
Fear1	I am most afraid of getting infected by COVID-19	3.82	0.40
Fear2	It makes me uncomfortable to think about Corona	2.03	0.33
Fear3	I am afraid of losing my life because of Corona	2.31	0.69
Fear4	When I watch news and stories about Corona on social media, I become nervous or anxious	3.69	0.49
Fear5	I cannot sleep because I'm worrying about getting Corona	2.04	0.27
Fear6	My heart races or palpitates when I think about getting Corona	2.05	0.25
Fear7	My hands become clammy when I think about Corona	1.97	0.17
TPS	Threat perception scale ($\alpha = 0.703$)	35.53	2.88
Threat1	My job puts me at great risk	4.02	0.63
Threat2	I feel more stress at work	4.00	0.47
Threat3	I have little control over whether I get infected or not	3.61	0.76
Threat4	I have little chance of survival if I were to get SARS	2.13	0.46
Threat5	I think of resigning because of SARS	2.17	0.45
Threat6	I am afraid I will pass SARS to others	3.93	0.40
Threat7	My family and friends are worried they get infected through me	4.07	0.32
Threat8	People avoid my family because of my work	3.83	0.98
Threat9	I am afraid of falling ill with SARS	4.04	0.50
ALtru1	I accept the risk of caring for SARS patient ^R	3.74	0.55
CBI	Copenhagen burnout inventory scale ($\alpha = 0.879$)	65.34	17.39
	Personal burnout ($\alpha = 0.921$)	64.80	17.32
PB1	How often do you feel tired?	63.57	17.87
PB2	How often are you physically exhausted?	63.94	17.84
PB3	How often are you emotionally exhausted?	65.01	17.72
PB4	How often do you think: "I can't take it anymore"?	65.45	15.47
PB5	How often do you feel worn out?	65.52	17.91
PB6	How often do you feel weak and susceptible to illness?	65.33	17.67
	Work-related burnout ($\alpha = 0.832$)	71.50	16.33
WB1	Is your work emotionally exhausting?	72.49	16.36
WB2	Do you feel burnt out because of your work?	70.85	14.03
8WB3	Does your work frustrate you?	71.80	16.86
WB4	Do you feel worn out at the end of the working day?	71.83	16.29

#	Scale items	Mean	S.D
WB5	Are you exhausted in the morning at the thought of another day at work?	71.04	15.32
WB6	Do you feel that every working hour is tiring for you?	71.55	14.49
WB7	Do you have enough energy for family and friends during leisure time? ^R	70.98	15.76
Client burnout ($\alpha = 0.874$)		58.70	16.14
CB1	Do you find it hard to work with clients?	56.91	23.33
CB2	Do you find it frustrating to work with clients?	57.22	24.00
CB3	Does it drain your energy to work with clients?	55.65	19.18
CB4	Do you feel that you give more than you get back when you work with clients?	56.09	22.42
CB5	Are you tired of working with clients?	71.23	20.58
CB6	Do you sometimes wonder how long you will be able to continue working with clients?	55.09	19.30
M:mean, SD:standard deviation, R: reversed coding			

Table 3
Association between socio-demographic characteristics and CBI subscales (N=398)

	n(%), N=398	Overall CBI		Personal burnout			Work-related burnout			Client-rela	
		Mean (SD)	P-value	Eta Squared	Mean (SD)	P-value	Eta squared	Mean (SD)	P-value	Eta squared	Mean (SD)
Gender			0.035	0.018		0.039	0.011		0.048	0.005	
Male	210 (52.8%)	64.01(10.96)			63.82(16.55)			70.86(15.33)			56.82(15.
Female	188(47.2%)	65.64(9.37)			65.78(14.54)			72.21(13.28)			60.37(18.
Age (years)			0.048	0.12		0.022	0.09		0.189	0.001	
Less than 40 y	143(35.9%)	66.56(11.39)	Ref		67.37(15.66)	Ref		72.16(15.79)			59.23(19.
≥40 y	255(64.1%)	64.04(9.71)	0.032		62.99(15.84)	0.007		71.25(13.29)			56.67(16.
Marital status			0.001	0.139		0.025	0.116		0.045	0.076	
Single/Divorced	159(39.9%)	66.83(10.72)			66.52(14.84)			72.38(15.22)			61.81(15.
Married/Engaged	239(60.1%)	63.12(9.01)			61.31(16.79)			68.87(15.11)			59.65(17.
Residence			0.581	0.003		0.635	0.004		0.377	0.005	
North/Akkar	66(16.6%)	66.01(10.06)			66.01(12.08)			71.11(14.97)			59.47(17.
Mount Lebanon	138(34.7%)	64.23(10.38)			67.23(16.53)			70.62(13.89)			53.78(17.
Beirut	105(26.4%)	65.63(11.05)			64.37(16.66)			71.89(15.11)			59.61(18.
South/Nabatyeh	45(11.3%)	64.18(7.61)			65.93(13.91)			69.21(12.77)			56.57(13.
Great Bekaa	42(11%)	64.98(8.01)			63.63(12.25)			72.48(11.67)			57.57(12.
Presence of dependent children at home			0.047	0.01		0.013	0.121		0.022	0.012	
No	208(52.3%)	64.38(10.23)			62.62(15.47)			70.75(15.03)	Ref		57.05(17.
Yes	190(47.7%)	66.40(10.18)			67.19(15.46)			72.18(13.79)			60.5(16.5
Presence of elderly at home			0.014	0.011		0.031	0.014		0.047	0.009	
No	211(47%)	63.18(9.74)			63.62(14.47)			70.75(15.03)	Ref		58.32(16.
Yes	187(53%)	68.61(10.98)			67.89(13.46)			72.18(13.79)			60.1(15.5
Family member with comorbidities			0.045	0.018		0.042	0.01		0.038	0.01	
No	184(46.2%)	63.98(10.23)			63.62(15.08)			70.75(15.03)	Ref		56.05(16.
Yes	214(53.8%)	67.10(11.03)			66.84(14.86)			72.18(13.79)			60.5(16.5

N: frequency, %: Percentage, SD: standard deviation, Eta sq.: Eta squared, the mean was unstandardized, Great bekaa included Bekaa and BaalbeckHermel pr

Table 4
Association between economic factors and CBI subscales (N=398)

	Overall CBI			Personal burnout			Work-related burnout			Client-related burnout		
	n(%), N=398	Mean (SD)	P-value	Eta sq.	Mean (SD)	P-value	Eta sq.	Mean (SD)	P-value	Eta sq.	Mean (SD)	P-value
Socio-economic status after COVID-19/Economic crisis*			<0.001	0.149		<0.001	0.121		<0.001	0.152		0.001
Rich	3(0.7%)	59.19(11.23)	Ref		58.25(15.33)	Ref		67.31(16.75)	Ref		57.01(15.76)	Ref
Middle	125(31.4%)	64.12(9.75)	0.008		64.67(16.76)			71.83(18.15)			58.22(16.32)	0.001
Middle to low	273(43.5%)	72.71(10.34)	<0.001		71.48(17.32)			75.36(15.23)			60.87(16.03)	0.001
Current income			<0.001	0.046		0.035	0.081		0.006	0.076		<0.001
<2 Million L.L	68(17.1%)	67.87(12.05)	Ref		66.44(17.22)	Ref		73.678(16.5)	Ref		64.04(19.17)	Ref
2-4 Million L.L	172(44.2%)	65.49(11.4)	0.087		63.39(14.85)	0.046		73.37(13.45)	0.543		56.37(20.26)	0.001
>4 Million L.L	154(38.7%)	63.07(7.09)	<0.001		61.98(15.82)	0.021		68.91(11.54)	0.001		54.92(16.55)	<0.001
Pandemic impact on income			0.046	0.082		0.033	0.082		0.043	0.051		<0.001
Minor	60(15.1%)	63.11(9.67)	Ref		62.92(16.06)	Ref		68.41(14.25)	Ref		56.96(16.32)	Ref
Moderate	199(50%)	64.85(9.68)	0.154		65.71(16.01)	0.048		72.44(14.67)	0.049		58.12(14.97)	0.001
Major	139(34.9%)	68.24(10.83)	0.009		66.94(12.4)	0.031		74.50(13.99)	0.018		60.53(18.17)	<0.001
Economic crisis impact on your income			<0.001	0.132		0.038	0.026		0.023	0.032		0.001
Minor	3(0.7%)	58.47(10.06)	Ref		61.13(15.83)	Ref		69.25(14.76)	Ref		56.98(14.76)	Ref
Moderate	57(14.3%)	64.72(11.28)	<0.001		64.67(16.04)	0.256		70.05(13.18)	0.276		58.62(15.23)	0.001
Major	338(84.9%)	73.01(10.81)	<0.001		68.03(16.45)	0.009		75.12(14.21)	0.003		60.31(15.76)	0.001
Health coverage			0.044	0.018		0.362	0.002		0.168	0.000		0.001
Public	23(5.7%)	64.81(9.41)			64.38(15.51)			70.62(14.11)			58.44(15.45)	
Private (insurance, syndicates..)	375(94.3%)	67.11(12.03)			65.66(16.07)			74.26(14.72)			60.22(20.34)	
Scale	Mean (SD)	Correlation (r)	p-value		Correlation (r)	p-value		Correlation (r)	p-value		Correlation (r)	p-value
IFDWF scale	2.86(1.43)	-0.23	p<0.01		-0.278	<0.01		-0.212	<0.01		-0.17	<0.01

N: frequency, %: Percentage, SD: standard deviation, Eta sq.: Eta squared, the mean was unstandardized

Table 5
Work characteristics and CBI subscales (N=398)

	Overall CBI		Personal burnout			Work-related burnout			Client-related burnout			
	N(%) N=398	Mean (SD)	P-value	Eta squ	Mean (SD)	P-value	Eta squ	Mean (SD)	P-value	Eta squ	Mean (SD)	P-value
Health facility type						0.035	0.011		0.012	0.029		0.03
Private	265 (66.6%)	62.5(10.36)			62.98(12.68)			69.11(13.34)			56.64(16.25)	
Public	133(33.4%)	68.1(10.06)			65.03(11.76)			73.46(14.22)			60.34(16.8)	
Location of the hospital			0.143	0.001		0.511	0.002		0.018	0.009		0.308
Rural	109(27.4%)	64.31(11.22)			63.54(14.71)			69.08(15.18)			58.54(17.05)	
Urban	289(72.6%)	66.52(10.83)			65.21(15.12)			73.8(14.27)			58.82(16.94)	
Working experience			0.003	0.010		0.043	0.019		0.028	0.017		0.64
Less than 10 years	120(30.1%)	68.25(11.83)			67.99(15.13)			73.15(14.22)				
10 years and more	278(69.8%)	62.64(11.47)			63.02(14.73)			68.13(13.89)			58.48(16.44)	
Previous experience in Outbreak/Pandemic/Emergency			0.048	0.009		0.043	0.018		0.031	0.008		0.038
No	103(25.8%)	65.81(10.46)			65.39(15.83)			73.59(13.25)			59.25(17.29)	
Yes	295(74.1%)	62.74(8.52)			61.54(14.02)			67.64(11.68)			55.66(14.82)	
Sleeping hours			<0.001	0.022		0.002	0.031		0.018	0.000		0.339
Less than 6 hours	210(57.7%)	69.03(10.35)			67.53(15.38)			67.48(12.27)			57.88(17.11)	
More than 6 hours	168(42.2%)	61.18(11.22)			62.02(13.17)			74.01(14.31)			58.98(16.89)	
Extensive working hours			0.011	0.017		0.876	0.000		0.022	0.012		0.43
No	99(24.8%)	62.56(9.08)			64.54(13.51)			70.01(14.34)			57.03(16.25)	
Yes	299(72.3%)	66.53(10.86)			64.34(14.72)			72.18(15.12)			60.12(16.8)	
Economic crisis impact on your work			<0.001	0.053		0.038	0.026		0.023	0.032		0.234
Minor	13(0.7%)	58.47(10.06)	Ref		61.13(15.83)	Ref		69.25(14.76)	Ref		56.98(14.76)	
Moderate	97(14.3%)	64.72(11.28)	<0.001		64.67(16.04)	0.256		70.05(13.18)	0.276		58.62(15.23)	
Major	288(84.9%)	73.01(10.81)	<0.001		68.03(16.45)	0.009		75.12(14.21)	0.003		60.31(15.76)	

N: frequency, %: Percentage, SD: standard deviation, Eta sq.: Eta squared, the mean was unstandardized

Exposure, perception of COVID-19 threat, fear of COVID-19, altruistic, health characteristics, and burnout

In terms of health-related characteristics and exposure, having good health status, previous history of COVID-19, and accepting the risk of taking care of COVID-19 cases significantly reduced burnout in all its aspects. As for fear of COVID-19 and higher perception of COVID-19 threat, these scales were correlated with higher burnout levels among physicians. Physicians who considered that pandemic had a major impact on their daily life and their familial relationship reported higher levels of burnout. The largest effect size was found for the perception of COVID-19 threat, altruistic and impact of COVID-19 on familial relationships. In terms of higher PB, it was associated with the same factors as the overall burnout in addition to the impact of the COVID-19 pandemic on the participants' social relationships. Altruism was significantly associated with a reduction of burnout in all its aspects (Table 6).

Correlates of burnout and its subscales: a multivariable analysis

In the multivariable analysis displayed in Table 7, higher burnout was associated with female gender, younger age, being specialized in infectious diseases or internal medicine, working in public hospitals, higher perception of COVID-19 threat, insufficient sleeping hours, low income, extensive working hours, having currently a dependent child, having a family member with comorbidities, having limited professional experience. However, being married, financial wellbeing,

good health status, previous history of COVID-19, altruistic, and previous experience of working during pandemic were significantly associated with lower burnout. The full model could explain 76.1% of the overall burnout. In terms of higher personal burnout (PB), it was associated with younger age, female gender, having a single or divorced marital status, presence of elderly or child at home, and living with a family member with comorbidities. In addition, higher threat perception, fear of COVID-19, sleeping disturbance, extensive working hours, and low income were associated with higher PB. However, factors such as financial wellbeing, altruistic and good health condition were associated with lower PB levels. The full model could explain 67.2% of the PB. As for work burnout (WB), similar factors were associated with higher burnout in addition to the type of hospital. The full model could explain 58.4% of the WB. In terms of client-related burnout (CB), we found that younger age, higher perception of threat, fear of COVID-19, and low income were associated with higher CB. Similar to the previous burnout dimensions, altruistic and large professional experience and financial wellbeing were associated with a decreased level of CB.

Table 6
Association between COVID-19 exposure, health characteristics, COVID-19 impact and CBI subscales (N=398)

	n(%), N=398	Overall CBI			Personal burnout			Work-related burnout			Client-related b
		Mean (SD)	P-value	Eta squ.	Mean (SD)	P-value	Eta squ.	Mean (SD)	P-value	Eta squ.	Mean (SD)
Health status			0.002	0.021		0.035	0.011		0.012	0.029	
Fair and Below	70(17.6%)	62.5(10.36)			63.11(14.68)			68.31(13.88)			57.64(16.25)
Good and above	328(82.4%)	68.1(10.67)			66.28(14.76)			74.16(12.94)			59.34(16.8)
Working in frontline			0.038	0.016		0.04	0.011		0.032	0.009	
No	151(37.9%)	63.5(10.36)			62.9(15.48)			69.41(14.63)			56.64(17.25)
Yes	247(61.1%)	67.1(10.06)			66.28(15.76)			73.16(14.22)			60.34(16.8)
Following up or caring of COVID-19 case			0.325	0.001		0.421	0.003		0.018	0.022	
No	191(48.1%)	64.17(10.39)			65.54(14.71)			70.08(15.18)			57.54(17.05)
Yes	207(51.9%)	66.32(10.14)			64.21(16.29)			72.8(13.77)			59.82(16.94)
Tested for COVID-19			0.794	0.000		0.053	0.009		0.098	0.007	
No	91(22.9%)	65.64(10.47)			63.97(15.63)			69.31(14.83)			58.48(16.44)
Yes	307(77.1%)	65.25(10.18)			67.58(15.13)			72.15(14.22)			59.43(18.71)
History of COVID-19 diagnosis			0.031	0.012		0.043	0.018		0.231	0.002	
No	337(84.7%)	65.81(10.46)			65.39(15.83)			71.79(14.65)			59.25(17.29)
Yes	61(15.3%)	62.74(8.52)			61.54(14.02)			69.84(12.88)			55.66(14.82)
Family member diagnosed as COVID-19			0.549	0.001		0.762	0.000		0.989	0.000	
No	222(55.8%)	64.99(10.49)			64.53(15.58)			71.48(14.54)			57.88(17.11)
Yes	176(44.2%)	65.62(10.05)			65.02(15.67)			71.51(14.31)			59.34(16.87)
Colleague ever diagnosed with COVID-19			0.245	0.004		0.39	0.003		0.004	0.048	
No	39(9.8%)	63.56(8.56)			64.33(15.44)			65.29(14.33)			55.98(14.61)
Yes	359(90.2%)	65.53(10.41)			69.12(16.68)			71.17(14.26)			58.99(17.21)
Pandemic impact on daily life			0.021	0.013		0.038	0.026		0.009	0.028	
Minor	42(10.5%)	63.992(8.76)	Ref		63.29(15.42)	Ref		66.42(15.49)	Ref		56.59(13.92)
Moderate	96(24.2%)	64.17(9.38)	0.213		65.27(15.48)	0.079		68.72(13.46)	0.213		59.37(18.21)
Major	260(65.3%)	66.96(10.86)	0.006		66.98(16.10)	0.002		73.06(14.54)	<0.001		63.61(15.71)
Pandemic impact on social relationship			0.176	0.002		0.003	0.031		0.321	0.000	
Minor	31(7.8%)	64.17(9.38)			61.33(15.76)			70.23(12.67)			57.33(17.05)
Moderate	185(46.5%)	65.32(9.56)			65.78(15.02)			71.97(14.13)			58.71(16.94)

	n(%), N=398	Overall CBI			Personal burnout			Work-related burnout			Client-related b
		Mean (SD)	P-value	Eta squ.	Mean (SD)	P-value	Eta squ.	Mean (SD)	P-value	Eta squ.	Mean (SD)
Major	182(45.7%)	66.23(10.15)			69.45(14.98)			72.33(14.46)			59.82(16.13)
Pandemic impact on family relationship			0.115	0.025		0.412	0.003		0.298	0.002	
Minor	71(17.8%)	62.43(8.89)	Ref		64.33(15.76)			69.98(12.67)			58.33(15.05)
Moderate	136(34.2%)	65.62(10.23)			64.78(15.02)			71.19(13.58)			58.71(16.72)
Major	191(48%)	69.33(10.86)			66.45(14.98)			73.01(14.36)			60.02(15.89)
Altruistic: Accepting the risk of caring for COVID-19 case			0.030	0.123		0.044	0.015		0.005	0.042	
No	77(19.3%)	66.58(10.61)			67.47(16.59)			72.48(14.18)			61.86(17.85)
Yes	321(80.7%)	63.58(8.56)			64.16(15.29)			67.39(14.67)			55.57(12.71)
Scales	Mean (SD)	Correlation (r)	p-value		Correlation (r)	p-value		Correlation (r)	p-value		Correlation (r)
Fear of COVID-19	2.55(0.34)	0.141	p<0.01		0.203	p<0.01		0.285	p<0.01		0.364
Threat perception	3.53(0.94)	0.326	p<0.01		0.319	p<0.01		0.138	p<0.01		0.132
N: frequency, %: Percentage, SD: standard deviation, Eta sq.: Eta squared, the mean was unstandardized											

Table 7
Multivariable analyses: Correlates of CBI and its subscales

Model	Standardized Coefficients Beta	P- value	Confidence interval		Adjusted R squared
			Lower bound	Upper Bound	
Correlates of the overall CBI					0.761
Female gender	0.202	0.022	0.062	1.038	
Age (≥ 40 vs < 40 y)	-0.167	0.001	-2.377	-0.132	
Marital status (married versus single/divorced)	-0.496	0.010	-2.466	-0.332	
Specialty (other specialties vs ID/internal medicine)	-0.876	0.048	-2.321	-0.514	
Hospital type (private vs public)	-0.130	<0.001	-3.272	-1.091	
Threat perception scale	0.478	0.001	0.187	0.742	
IFDFW scale	-0.222	0.044	-1.934	-0.048	
Sleeping hours (≤ 6 hours vs > 6 hours)	0.169	0.038	0.091	0.563	
Low income	0.318	<0.001	1.920	2.204	
Health status (good vs poor)	-0.123	0.029	-1.642	-0.052	
Child at home	0.397	0.018	0.139	1.121	
Family member with chronic disease	0.104	0.665	0.762	1.195	
Working in the frontline	0.318	0.004	0.757	1.089	
Diagnosed as COVID19 case	-0.185	0.042	0.582	0.101	
Previous experience of working in outbreaks	-0.289	<0.001	-0.934	-0.048	
Work experience (small vs large)	0.092	0.560	0.026	1.567	
Fear of COVID-19	0.311	<0.001	0.431	0.912	
Altruistic(yes vs no)	-0.167	0.006	-0.476	-0.087	
Extensive working hours	0.131	<0.001	0.182	0.626	
Sleeping hours (less than 6 hours vs more than 6 hours)	0.299	0.018	0.171	0.533	
Correlates of the Personal burnout					0.672
Age (> 40 y)	-0.110	0.048	-5.272	-0.091	
Marital status (Single/divorced vs Married)	0.222	0.022	0.839	-0.162	
Gender (Female)	0.478	0.001	0.187	0.742	
Health condition (Good vs bad)	-0.167	0.001	-2.377	-0.132	
Elderly at home	0.125	0.560	0.106	1.567	
Presence of child at home	0.496	0.010	0.332	0.866	
Family member with comorbidities	0.318	<0.001	1.920	2.204	
Presence of elderly at home	0.297	0.018	0.139	1.121	
Threat perception scale	0.215	0.046	0.186	1.267	
Altruistic	-0.011	0.016	0.762	1.195	
Extensive working hours	0.218	0.004	0.757	1.089	
Low income	0.779	<0.001	0.101	0.582	
Fear of COVID-19	0.540	0.036	0.230	1.260	
IFDFW scale	-0.345	<0.001	-1.340	-0.138	
Sleeping hours	0.270	<0.001	0.170	1.252	
Correlates of Work-related burnout					0.584
Age (> 40 y vs less than 40y)	-0.310	0.048	-5.272	-0.091	

Model	Standardized Coefficients Beta	P-value	Confidence interval		Adjusted R squared
			Lower bound	Upper Bound	
Marital status (Single/divorced vs Married)	-0.122	0.022	-0.756	-0.108	
Hospital type (private vs public)	-0.067	0.001	-1.277	-0.037	
Gender (female vs male)	0.123	0.029	0.052	1.642	
Health condition (bad vs good)	0.297	0.018	0.139	1.121	
Working in the frontline	0.379	<0.001	0.101	0.582	
Diagnosed as COVID19 case (yes vs no)	-0.198	0.002	-0.613	-0.152	
Colleague diagnosed with COVID19 (yes vs no)	0.325	0.008	0.187	0.457	
Threat perception scale	1.241	0.027	0.492	2.387	
Fear of COVID-19	1.055	<0.001	0.842	1.568	
Altruistic (yes vs no)	-0.418	0.023	-0.753	-0.215	
Low income	2.317	<0.001	1.017	4.213	
Previous experience of working in outbreaks	-0.093	0.007	-0.325	-0.034	
Fear of COVID-19	1.993	0.002	0.916	3.018	
IFDFW scale	-0.292	0.004	-0.456	-0.126	
Extensive working hours	1.671	0.027	0.814	3.543	
Correlates of client-related burnout					0.632
Age (>40 y vs ≤40 y)	-0.163	<0.001	-0.453	-0.128	
year of experience (large vs small)	-0.291	<0.001	-0.376	-0.130	
Threat perception scale	1.953	<0.001	1.543	2.712	
Altruistic (yes vs no)	-0.267	<0.001	-1.312	-0.106	
Low income	0.616	<0.001	0.523	1.812	
Previous experience of working in outbreaks	-0.112	0.007	-0.820	-0.065	
Fear of COVID-19	1.431	0.018	1.054	2.617	
IFDFW scale	-0.104	<0.001	-0.298	-0.076	
Linear regression using stepwise method					

Interaction between threat perception of COVID-19 and financial wellness score

The multivariate analysis showed a significant interaction between the threat perception of COVID-19 and the financial wellness (IFDFW) scores on estimated marginal means of burnout. Estimated marginal means showed a significant linear increase of contrasts between the four categories of physicians: those with no perceived threat and IFDFW (Category 0), those with perceived threat and IFDFW (Category 1), those with perceived threat and no IFDFW (Category 2) and those with no perceived COVID-19 threat and no IFDFW (Category 3). Compared to physician with no perception of COVID19 threat and financial well-being (CBI=58.9; PB=60.1, WB=63, CB=53.5), threat perception of COVID-19 added some burnout (CBI=63.9, PB=62.8, WB=67.5, CB=55.9) followed by a higher increase related to financial distress (CBI=64.1, PB=65.7, WB=70.5, CB=57.1) while the highest increase in burnout was found in subjects presenting high perception of COVID-19 threat and financial distress (CBI=65.7, PB=67.8, WB=73.1, CB=59.9).

Main Findings

Our findings demonstrate a significant and huge burnout level among physicians during these unprecedented times in the context of the COVID19 pandemic and economic crisis. A strong association was found between sociodemographic variables and burnout such as female gender, younger age, being single, having a dependent child or living with an elderly or having a family member with comorbidities and reduced sleeping hours. Similarly, occupational factors such as physician specialty, working in a public health facility, limited years of professional experience, lack of previous experience in a pandemic, and extensive working hours were associated with a high level of burnout. Economic factors and COVID-19 exposure factors such as low income, threat perception of COVID-19, fear from COVID-19, and working in the frontline were also contributing to a high level of burnout. However, financial wellbeing, altruism, having a good health status, and being diagnosed as COVID-19 were significantly associated with lower level of burnout. The analysis of the combined effect of the COVID-19 pandemic and financial wellness (IFDFW) demonstrated that the presence of both threat perception COVID-19 and financial hardship significantly increased the level of burnout.

In terms of burnout prevalence, our findings revealed that burnout hits more than 90% of the Lebanese physicians and around 20% suffered from a high level of burnout. In addition, more than the third quarter of them expressed personal burnout (mean=64.8) and work-related burnout (mean=71.5). As for client-related burnout (mean=58.7), it was detected among 69.6% of respondents (mean=58.7). Before the pandemic, physician burnout and its effects have been widely documented by several studies conducted among physicians [61–64]. For example, a study reported that 45.8% of US physicians had experienced burnout [28].

The prevalence of burnout and its components detected in the present study are generally higher than those reported prior to the pandemic which was further supported by numerous studies. For example, an overall burnout of 48.7% was reported by a systematic review covering 176 studies from 2018 [65]. In Jordan, burnout was prevalent among 57.7% of physicians during COVID-19 [66].

Of note, it was not possible to compare our results directly with the findings of a previous study conducted among Lebanese physicians in 2013 before the pandemic [67], due to the use of different scales to assess burnout. However, comparing to other studies using the CBI scale, our findings seem to be much higher than the percentage reported in such studies before or even after the pandemic. For example, a study conducted among emergency physicians (EPs) in Bahrain (N=116) showed that those physicians reported a prevalence rate of 81.0% for personal burnout (mean=63), 69.8% for work-related burnout (mean=60), and 40.5% for patient-related burnout (mean=43) [68]. Another study conducted among general practitioners in Germany showed that one-third of the participants suffered from PB symptoms, one quarter showed WB while only 12% of them reported a high prevalence of patient-related burnout symptoms [69].

This crippling effect on mental health revealed by the huge prevalence of burnout among Lebanese physicians could be explained as the upshot of such typical context that cumulate the traumatic effect of the COVID-19, one of the deep existential crises revealed by the COVID19 pandemic [70] and the Lebanese unprecedented economic downfall that deteriorate the financial and psychological wellbeing of the physicians. Hence, urgent measures that tackle this tragedy are required to save an already ailing health sector.

In terms of sociodemographic characteristics associated with a higher level of burnout among physicians, our findings showed that higher burnout was associated with the female gender. However, when it comes to which gender is most affected by burnout, there have been contrasting results with some studies finding no gender differences whereas other studies found that female surgeons experienced more burnout compared to male counterparts [2]. However, our findings were consistent with the results of studies conducted by McMurray et al. [71] found that physicians women had increased odds of reporting burnout when compared to men and by Kannampallil et al. who found that there was a higher prevalence of burnout amongst women during the pandemic [72]. Furthermore, this study highlighted the association between younger age and a high level of burnout. Such finding is comparable with the results of a study among general practitioners and residents in Hungary that considered younger age as the strongest predictor of burnout in its emotional exhaustion aspect [73]. Another study conducted among physicians in Portugal and assessing burnout during the pandemic reported that younger age and female gender were independent determinants of burnout, similar to our results [74].

Another important aspect of burnout, noticed in our study was that being married or having a partner decreased the level of burnout. Our results were comparable to the results of a study conducted by Shanafelt et al [28] who supported that having a partner or being married was associated with a decreased risk of burnout McMurray et al [6]. This could be explained by the fact that physicians who are supported or feel supported by their partners or loved ones at home experience less burnout when compared to those who do not. In another study, it was found that support by a spouse decreased burnout by 40% [3].

Notably having a dependent child, or living with a family member with comorbidities were associated with higher burnout levels having limited professional experience. Our results were comparable to those reported by Koh et al. and Maunder et al. both suggest that having children is a predisposing factor to burnout [4, 5]. However, McMurray et al. found that women physicians who had young children to look after reported a decrease in burnout by 40%, if there was a spouse, supporting colleague, or significant other to balance work and home issues [3]. In summary, concerns about contracting the disease and about family members getting it was also linked to higher stress and anxiety [75].

In terms of pandemic-related factors, a higher perception of COVID-19 threat was also associated with a higher level of burnout. It is well recognized that Intense fear and threat perception when people experience physical and psychosomatic disorders lead to such anxiety, depression, burnout, and emotional exhaustion [76–78] which can shape the greatest behavioral changes. In addition, the uncertainty surrounding the pandemic in terms of healthcare policy reform and compensation changes could instigate a higher level of burnout.

In terms of economic factors, a current low socioeconomic status and income, in addition to negative financial wellbeing, were associated with a higher burnout level. Our results were consistent with a study reporting that lack of job security perception appeared to be the most important predictive factor for exhaustion. Of note, a previous higher socioeconomic status and a current fear of poverty were associated with higher stress and burnout, whereas current financial wellness was correlated with lower burnout. Such piercing association in low- and middle-income countries leading to several mental disorders [79] is typical for the Lebanese context where even physicians with savings in the country's banks were unable to reclaim their money. Moreover, owing to the enormous devaluation in the country's currency the total loss in physicians' income total loss was more than 80% [8]. The current situation results in alarming consequences, including increased trends in the prevalence of burnout, and psychiatric illnesses [80, 81] in addition to an uphill of physicians who left the country searching for stability, financial wellbeing, and safety for themselves and their families. This exodus is frightful since many of these physicians left despite they worked in well-established and recognized university hospitals where they both practiced and educated future physicians. Rising poverty and economic insecurity are associated with stress [54] (Cooper, 2011). which in turn, can lead to burnout and demission. In a country in freefall where the economic crisis is expected to escalates, health facilities were in danger of laying off employees, postponed some services, or completely closing their doors.

In terms of occupational factors, the first concept to be discussed was the specialty of the physician. Our findings showed that internal medicine and infectious diseases specialties of physicians were associated with higher levels of burnout compared with other specialties. The difference of burnout by

specialties was also highlighted by the meta-analysis conducted by Lee, et al. (Correlates of physician burnout across regions and specialties: a meta-analysis. The role of specialties as a contributor to burnout in our study may be partly due to differences in exposure to COVID-19 cases as ID specialists, and internal medicine physicians such as pulmonologists and cardiologists were more involved than other physicians in the treatment of COVID-19 cases. Besides, our findings highlighted that burnout rates were highest amongst physicians involved in frontline care. This was expected since their job deals with uncertainty all the time and they are in direct exposure to COVID-19 cases. This finding was in line with the results of a study conducted by Kannampallil et al. who reported that physicians who were exposed to COVID-19 tested patients had a higher prevalence of burnout (46.3%) compared to those who were not exposed (33.7%) [14].

However, other studies conducted among physicians found different aspects [65]. For example, Wu et al. and found that medical staff working on the front line had a lower level of burnout compared to those working on usual wards explaining this unexpected trend, by suggesting that frontline workers may have felt a greater sense of control over the situation. Similar to other studies, our findings showed that insufficient sleeping hour and extensive working hours were associated with a higher level of burnout.

One peculiar finding in our study was that working in public hospitals was found also associated with higher burnout. This could be because public hospitals were firstly designated by health authorities to receive, treat and isolate COVID-19 cases, so physicians working in these health facilities were more exposed to COVID-19. In addition, due to economic collapse, the government, short on funds, and was unable to support alone hospitals with much-needed resources and supplies as the pandemic surged. This was dependent on the support of foreign and local non-governmental aid to import essential supplies and equipment, including personal protective equipment (PPE).

In regards to extensive working hours and sleep deprivation, numerous studies highlighted that sleep deficiency is a key risk factor for burnout among physicians [82]. With the soar of COVID-19 cases, physicians are facing intense workload, extensive working hours, which eventually impact physicians sleeping hours. A study conducted prior to the pandemic showed that 33% of the HCWs were screened positive for the sleeping disorder [17] and this was associated with 4-fold bigger odds of burnout.

In addition to the above, limited work experience was associated with higher burnout levels. Our findings are also consistent with the results of a Portuguese study that found that healthcare providers with larger experience were less affected by burnout [83] and with those of a study evaluating the prevalence of burnout using the CBI scale among hospital physicians in Lithuania, which found a significant reverse relationship between work- and patient-related burnout and length of employment [84]. On the contrary, previous experience during a previous pandemic or emergency decreased the level of burnout. This can be due to their skills acquired from previous comparable situations. Such previous experience will provide the physician with a sense of confidence and control over the situation and lessen his worries and concerns when dealing with patients. We also found that physicians with good health status and previous history of COVID-19 experienced a lower level of burnout. Their good health status could lessen their perception of susceptibility and severity of COVID-19 and history of COVID-19 instigate their sense of being immune naturally.

The role of altruism in decreasing the level of burnout was supported in our study as we found that the burnout level of physicians who accept the risk of caring of COVID-19 cases and who choose that willingly was lower than the burnout level of the physicians who didn't accept this risk. Our results were compatible with the findings of a study conducted among Turkish physicians which reported that the burnout level of physicians who were actively involved in the fight against COVID-19 was lower than their counterparts who are not actively involved [85].

Lastly, the combined effect of the threat of COVID-19 pandemic and financial hardship supported that the dual presence of COVID-19 fear and economic collapse significantly increased burnout levels among physicians. Despite the scarcity of previous studies tackling such a topic, a review supported the effect of economic uncertainty on mental health in the era of COVID-19 [86]. Despite that such topic was not tackled previously among physicians, the increased risk of burnout among Lebanese physicians necessitate a combined approach addressing the stressors resulting from both of the pandemic and economic crisis. It highlights needed measures to reduce the financial strain on physicians and puts forward recommendations to support the psychological and financial wellbeing of physicians.

Limitations:

However, there are several limitations to be acknowledged in our study. First, the design of our study was cross-sectional design which does not allow us to deduce causality. Selection bias is possible due to the snowball technique that was used to collect data which limits the generalizability of the findings. The collected data was also based on self-reported information which makes it prone to social desirability and might cause a non-differential error and drive the results towards the null, leading to underestimation of some associations. Furthermore, because survey respondents voluntarily completed the survey, only those who may have had available time during the pandemic may have participated. This may have led us to capture less of a selection of physicians that had higher demands on the job during this period, possibly leading to underreporting of burnout during the pandemic. Another possibility was that physicians who are suffering from this syndrome were more interested to participate. In addition, fatigue related to increased computer and screen usage during the pandemic and lack of financial incentive for completing the survey may have further contributed to refusal of participation. Third, since we did not have comparable data about burnout of physicians just prior to the pandemic, we were not able to evaluate any incremental effect of the COVID-19 pandemic on burnout. Finally, although taking into consideration of some potential confounders in the multivariable models, residual confounding is still possible. Further studies following up on the burnout of Lebanese physicians would be recommended in the future to confirm our results especially that the economic crisis escalates sharply since December 2020.

Implications for Clinical Practice and Research

The alarming level of burnout detected among Lebanese physicians represented only the tip of the iceberg of the crisis in Lebanon. Its negative impacts that begin to effervesce with the exodus of some physicians would not be restricted to those healthcare providers but would also affect the patient's quality of care

and the healthcare organizations [19]. Due to the uncertainty of the length of the current pandemic and the ongoing economic crisis, one can only speculate the lasting impact to be considerable. However, to date, there were no realistic evidence-based interventions and tangible measures that focused on physician burnout in Lebanon. Hence, it is important to address factors identified by our study that potentially contributing to burnout among physicians identified by our study to mitigate the long-term negative consequences. More studies exploring possible interventions based on physicians' preferences and the feasibility of such interventions were recommended. These interventions could include a formalized burnout reduction program and the availability and accessibilities to helplines and counselors. Since our study highlighted the importance of partner existence, a supportive network from partners, peers, and dependents is needed. We suggest also developing specific training integrating stress management methods and pandemic planning during medical school and residency education. Since gender difference was revealed in our study to affect burnout level, hence gender-based issues may require to be addressed. It is of high priority that government and health facilities start to recognize and roll out effective interventions to prevent and mitigate physician burnout. Lastly, addressing the physician's financial hardship seems to be the first matter to be targeted in such a situation.

Discussion

The COVID-19 pandemic has aggravated the levels of burnout among health care providers, particularly among physicians who had to shoulder the burden of COVID-19. Our present study aims to assess the level of burnout among physicians stranded amid a mixture of the crisis revealed by the ongoing COVID-19 pandemic and the economic crisis along with how sociodemographic, occupational, economic, and pandemic-related factors affect the intensity of burnout. Lastly, it aimed to explore the combined effects of the COVID-19 pandemic and economic crisis on burnout among Lebanese physicians. It is believed that this paper is the pioneer study in Lebanon focusing on burnout during the context of double hit and investigated factors associated with this burnout and the combined effect of crises among physicians.

Conclusion:

After dealing with more than a year of the stressors of the COVID-19 pandemic combined with an unprecedented economic collapse, Lebanese physicians reached a crisis point and the problem is only getting worse in absence of urgent measures. The huge and serious prevalence of burnout among Lebanese physicians reported by our study called for collaborative efforts from all stakeholders in healthcare to adopt urgent measures and to develop and implement effective remedies for physician burnout. Taking into account the unveiled factors contributing to burnout in this study, interventions and effective coping strategies based on a combination of personal-level and system-level measures are required to regain resilience and to optimize work quality or quantity based on physicians' preference. Special focus should be accounted to improving physician financial wellbeing and work satisfaction. It is time to make eliminating physician burnout a priority to preserve this country's most valued health care asset.

Declarations

Author Contributions:

D.Y. was involved with study conception and design, data collection and analysis, drafted and revised the manuscript.

M.K and L.A.A were involved in data collection and analysis and revising the article.

J.Y , H.M and F.S were involved with study conceptualization and design, drafting and revising the article.

H.S was involved in the study conceptualization and the revision of the manuscript. All authors have read and agreed to the published version of the manuscript.

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Informed Consent Statement:

Informed consent for participating in the study was obtained digitally through Google Forms from all subjects, and all methods were carried out in accordance with the relevant guidelines and national regulations for the Non-clinical studies. Specifically, at the beginning of the questionnaire, participants were asked whether they agree to participate in the research in order to be included in the study. Participants were also informed that their participation was voluntary and that they had the right to leave at any time without providing any explanation. No incentives were provided to the study participants.

Data Availability Statement:

After publication, the survey data will be made available on reasonable request to the corresponding author. A proposal with a detailed description of study objectives and a statistical analysis plan will be needed for assessment of requests. Additional materials might also be required during the process of assessment.

Conflicts of Interest

The authors declare that they have no competing interests and they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Consent for publication

Not applicable.

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Abbreviations

COVID-19: Coronavirus disease 2019

CBI: Copenhagen Burnout Inventory

IFDFW: InCharge Financial Distress/Financial Well-Being

FOC: Fear of COVID-19

HCWs: Health care workers

PPE: Personal Protective Equipment

PB: Personal burnout

WB: Work-related burnout

CB: Client-related burnout

MOPH: Ministry of Public Health

UK: United Kingdom

USA: United States of America

SPSS: Statistical package for social sciences

C.I: Confidence interval

SD: Standard deviation

α : Cronbach alpha

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Figures

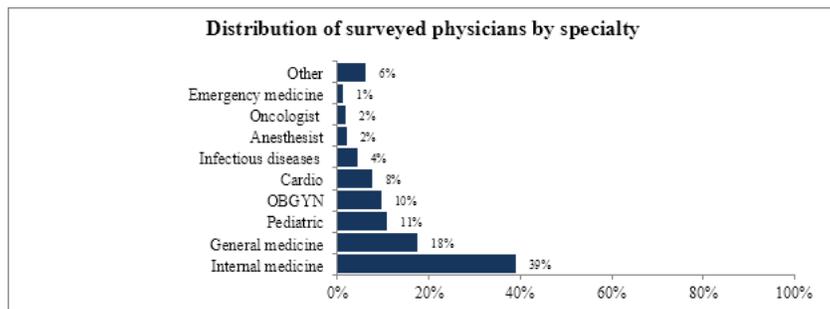


Figure 1

Distribution of surveyed physicians by specialty

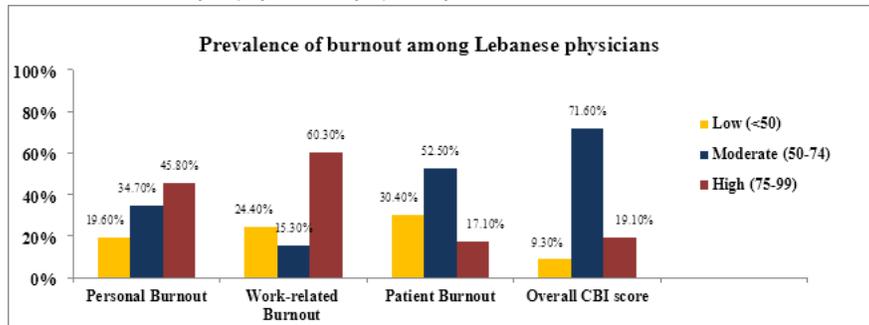


Figure 2

Prevalence of burnout and its three dimensions among Lebanese physicians

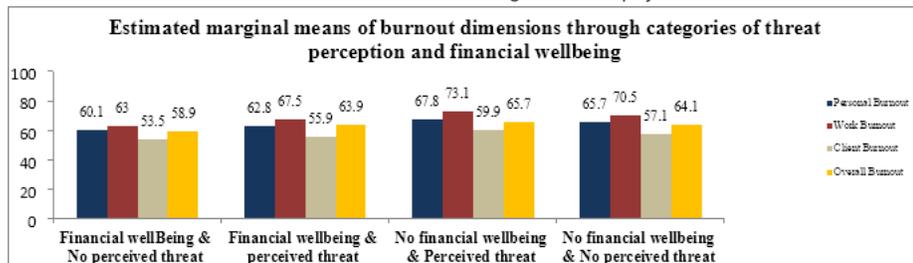


Figure 3

Estimated marginal means of burnout and its dimensions through categories of threat perception scale (low and high) and financial wellbeing (IFDFW).