

Burnout among Health Care Workers during COVID-19: An Applied Study at King Abdulaziz Hospital in Al Ahsa

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Received: May 15, 2022 Accepted: June 9, 2022 Online Published: June 15, 2022

doi:10.5539/gjhs.v14n7p36

URL: <https://doi.org/10.5539/gjhs.v14n7p36>

Abstract

The objective of this study was to measure burnout prevalence among health care workers at KAH during the COVID-19 pandemic. The method applied in this study was a descriptive quantitative approach. We collected the data via self-assisted online survey utilizing the Copenhagen Burnout Inventory (CBI), a reliable instrument to measure burnout by investigating its three subdomains: personal, work-related and client-related. The results came out from this study were that: 244 HCWs completed the questionnaire. The mean of total burnout, personal burnout, work-related burnout, and client-related burnout score was 55.89 (SD 19.8), 64.8 (SD 22.16), 57.6 (SD 21.05) and 45.18 (SD 24.54), respectively. Factors that contributed to the increased levels of burnout included: younger age, female gender, the nursing profession, fewer years of experience, extended working hours per shift, fewer off days per month, fewer hours of sleep per night, increased workload, prolonged contact with COVID-19 cases, frequent change in regular job duties and the higher perceived psychological impact of the pandemic. The study concluded that healthcare workers at KAH experienced high rates of personal burnout and work-related burnout during the COVID-19 pandemic. Therefore, institutional intervention to address burnout was deemed necessary.

Keywords: Burnout, COVID-19, Healthcare, Pandemic

List of Abbreviation

COVID-19: Novel Corona Virus Disease- 2019

HCWs: Health Care Workers

CBI: Copenhagen Burnout Inventory.

MBI: Maslach Burnout Inventory.

WHO: World Health Organization.

KAH: King Abdulaziz Hospital in Al Ahsa

KAIMRC: King Abdullah International Medical Research Center

PPE: Personal Protective Equipment

1. Introduction

1.1 Preface

After originating from China in September 2019 and later turning into a pandemic in March 2020, the novel corona virus-19 disease (COVID-19) induced panic and concern all over the world as a real threat to human existence and affected everybody's mental well-being (World Health Organization [WHO], 2020). The virus was confirmed to be highly transmittable among people directly via sneezing and coughing droplets or indirectly by touching one's nose, eyes, or mouth, which allowed the virus to spread rapidly outside China across the globe (Tizau et al., 2020). From the beginning of the pandemic until July 2021, cumulative infected individuals exceeded 190 million affirmed cases and over 4 million deaths globally (WHO, 2021). In Saudi Arabia, the government enforced COVID-19 precaution measures by suspending entry to the kingdom and strengthening screening procedures in

February 2020. The officials detected the first positive case in Eastern Region in March 2020, and they immediately activated the curfew directives in the affected towns (Ministry of Health [MOH], 2021).

Outbreaks such as the COVID-19 pandemic placed extraordinary loads upon healthcare services and put immense psychological distress on healthcare workers (HCWs), in which HCWs' burnout in reaction to the profession's stressful obligations was already an epidemic (Restauri et al., 2020). According to Walton et al. (2020), HCWs' psychological burden was not due to the increased volume of work only, but also due to fear of contracting the virus themselves and transferring it to their beloved ones, implementing new procedures, and caring for very deteriorating patients and for co-workers who have also become ill. During the COVID-19 pandemic, Lai et al. (2020) recorded high levels of insomnia, anxiety and depression among Chinese HCWs in Wuhan, with a 71.5% psychological distress prevalence. In Saudi Arabia, 40% of the population and 73.6% of the HCWs reported distress due to COVID-19. A piece of evidence was that HCWs, especially front-line staff, were at higher risk of suffering psychological distress than the general public (Al Hanawi et al., 2020). In Australia, a study was done in a tertiary hospital in Melbourne to evaluate the burnout and psychological distress among 406 HCWs during the pandemic. Participants revealed moderate to severe symptoms associated with burnout, especially those working in close contact with COVID-19 Patients. 21 % showed depression symptoms, 20% reported anxiety, and 29% had post-traumatic stress disorder (Dobson et al., 2020). Researchers reported similar findings of psychological distress and anxiety associated with COVID-19 among HCWs in several countries, such as New York, USA (Shechter et al., 2020), Turkey (Elbay et al., 20220), and some other western countries (Danet, 2021).

Burnout could be realized as a condition of mental, emotional, and physical fatigue resulting from prolonged exposure to stressors and continuous intervention with sentimentally demanding situations in the workplace. It has been well-thought-of a very work-related health threat among HCWs more than in other professions due to the nature of their work requiring continuous emotional involvement with patients' problems. Exhaustion and fatigue were the core of burnout, well-defined by the extents of personal burnout, work-related burnout, and client-related burnout (Kristensen et al., 2005). HCWs with burnout showed a significant decrease in professional performance, poor commitment to the profession and the organization, medical faults, more personal suffering, and low job satisfaction (Noseworthy et al., 2017). They also recorded more occurrences of absenteeism, high rates of clinic visits and medical leaves, which had an impact on the cost and quality delivery of healthcare services (Borritz et al., 2006).

1.2 Research Aim and Objectives

In the COVID-19 pandemic setting, this research aimed to estimate the levels of burnout perceived by healthcare workers at King Abdulaziz Hospital (KAH) in Al Ahsa- Saudi Arabia. This aim was achieved through the following objectives: investigating personal burnout, disclosing work-related burnout, and exploring client-related burnout.

1.3 Variables in Research

- 1). Burnout: the state of physical or emotional exhaustion resulted generally because of persistent stress. Including:
- 2). Personal burnout: the state of physical and psychological fatigue perceived by an individual.
- 3). Work-related burnout: the physical and psychological exhaustion that was experienced by an individual relative to workplace.
- 4). Client-related burnout: the physical and psychological exhaustion that was experienced by an individual relative to working with customers.

2. Literature Review

2.1 Burnout Definition

Burnout literature identified several risk factors associated with higher levels of burnout, such as age, gender, occupation, distress and anxiety. During the past three decades, burnout was thought of as an occupational hazard among HCWs, rating from 25% to 75% in some clinical specialties (Laschinger et al., 2006). In normal situations, half of physicians struggled to control emotional fatigue resulting from work-related stress (West et al., 2018). However, there was an unusual condition in the Netherlands, where researchers recorded a prevalence of burnout only in 4% of the sample of HCWs (Meynaar et al., 2015).

Dimitriu et al. (2020) reported that COVID-19 intensified existing stressors on HCWs and created new ones, including direct involvement with infected patients and exposure to the infection, and being potential trajectories of disease transmission to their families. Wearing of Personal Protective Equipment (PPE) for an extended period,

excessive heat produced by PPE, dehydration, shift modifications, extended work schedules, and lack of enough sleep resulted in burnout among health care providers during the pandemic.

2.2 Personal Burnout

Duarte et al. (2020) reported high levels of personal burnout experienced by 52.5% of the 2008 HCWs fighting the COVID-19 pandemic in Portuguese. Female gender, single status, and close contact with infected patients were the main predictors of personal burnout. Roslan et al. (2021) estimated a 53.8% prevalence of personal burnout in a sample of 893 Malaysian HCWs. Respondents who were younger and involved directly in screening or treating COVID-19 patients were more likely to experience higher rates of personal burnout. In Tokyo, research to determine the prevalence of burnout among HCWs at St Luke's International Hospital during the COVID-19 pandemic concluded that burnout prevalence among the 312 participants was 31.4%. The study found higher burnout levels in younger staff, females, and staff with more intense work schedules or fewer years of experience (Takahiro et al., 2020). In Italy, researchers used the MBI to explore the prevalence of distress, anxiety, and burnout in HCWs during the peak of the COVID-19 pandemic. They concluded that nearly a third of the 797 participants had high rates of burnout and associated increasing workload, work changes and everyday communication with COVID-19 patients with the worst psychological consequences and a higher risk of distress, anxiety, and burnout (Naldi et al., 2020). Ferry et al. (2020) researched to evaluate burnout among 539 HCWs in the UK. Almost 80% recorded moderate to severe burnout rates. The study concluded that being younger, female, having a history of depression or having close contact with confirmed COVID-19 patients were the most independent predictors of burnout. In a study among 2268 full-time nurses in Taiwan, Weishan et al. (2015) reported that sleeping period on workdays negatively correlated with the beginning of burnout. HCWs who used to sleep fewer than six hours a day bore a higher risk of job strain and burnout than those who slept seven hours or more per working day. On the other hand, Giorgi et al. (2020) discovered a circular association between sleep quality and burnout, intermediated by the effects of personal burnout on impaired sleep quality and daytime dysfunction on the existence of total burnout.

2.3 Work-Related Burnout

75% of the 646 HCWs sample from KSA hospitals reported high levels of work-related burnout. Significant predictors were age, job title, length of professional experience, the extended working time during the epidemic, hours of sleep each day, and contact with infected patients (Al Sulaimani et al., 2021). Duarte et al. (2020) linked higher levels of work-related burnout among more than 53% HCWs in their sample to direct interaction with COVID-19 patients, being a front-line worker or having high levels of depression and stress. Sklar et al. (2021) inspected the effects of job changes on work-related burnout and subsequent turnover intents of mental health providers from six public mental health clinics in the USA. They found that HCWs who experienced more work changes in duties, locations and groups were more likely to develop higher levels of work-related burnout and were consequently more likely to consider leaving their current jobs within a short period. Ro-ting et al. (2021) associated work-related burnout among HCWs with the increased number of working hours. They observed a significant increase in burnout once the number of working hours exceeded 40 hours a week. The association between burnout and length of working time, examined for averages of 40 to 120 hours a week, showed that odds ratio of burnout grew faster whenever weekly average working hours crossed 80 hours. If the average weekly working hours were lowered from 80 to 70, the odds ratio of burnout would be reduced by around 25%. A reduction to 60 hours per week would nearly split the odds ratio. Using the MBI tool, a study recruited 261 nurses to investigate the levels of burnout and emotional exhaustion prevalence among nurses in Shiraz hospitals. The findings indicated 64.6% overall burnout prevalence during the pandemic and linked high rates of burnout with job pressures and stress (Kamali et al., 2020). Wisetborisut et al. (2014) registered a 10% higher burnout occurrence among shift workers than non-shift HCWs and linked long years of working shifts with increased burnout odds. They also associated sleeping more hours per night with decreased odds of burnout among healthcare professionals. Additionally, Shift-working nurses who had at least eight days off per month reported fewer symptoms of burnout than those who had less than eight days off. Sabancıogullari and Dogan (2015) stated that because of prolonged sleep deprivation, shift workers frequently made faults due to drowsiness and exhaustion, with subsequent job discontent and burnout, even with the existence of personal motivation and professional improvement programs.

2.4 Client-related Burnout

Job uncertainty raised the likelihood of developing client-related burnout, according to Rasa et al. (2020). They discovered that HCWs with high levels of employment uncertainty had a higher probability of experiencing patient-related burnout by two times compared to HCWs with low levels of career insecurity. Courtney et al. (2019)

indicated that HCWs who believed their patients were not progressing experienced client-related burnout. Workers also showed decreased job satisfaction, lower commitment to the organization and increased turnover intentions. In their study to explore the burnout among 2026 Indian clinical practitioners, Khasne et al. (2020) found that 53% of the respondents experienced high client-related burnout (pandemic related burnout). Individuals employed in critical hospital locations designated to treat infected patients showed a considerably higher frequency of client-related burnout.

3. Research Methodology

3.1 Methods

This online cross-sectional study focused on descriptive quantitative approaches to investigate the occurrence of burnout among different clinical professions within a hospital setting during the COVID-19 pandemic and to determine relationships between variables (Oberiri Apuke., 2017).

There are several tools accessible for measuring burnout, including Maslach Burnout Inventory (MBI), Oldenburg Burnout Inventory (OLBI), Copenhagen Burnout Inventory (CBI), and Shirom Melamed Burnout Measure (SMBM). MBI is the oldest and most frequently used instrument (Maslach et al., 1996). However, we opted to build our survey on the CBI because it appeared inclusive, consistent, clear and understandable. The CBI was validated and proved to have reliable psychometric properties that evaluated burnout among health professionals (Kristensen et al., 2005).

3.2 Population and Sample

This study targeted the population of HCWs working at KAH during the time of implementing this study. The five professions included were confirmed by the Human Resources department as the following: medical services (397 staff), nursing services (499 staff), pharmacy services (67 staff), medical imaging (45 staff), and pathology & laboratory (116 staff). The sample size was calculated with a 95% confidence interval and a 6% marginal error using an online calculator (<https://www.surveysystem.com/sscalc.htm>). Accordingly, the sample size required to conduct this study was 216 participants.

3.3 Tools and Data Collection

Data collection took place from 05 September 2021 to 03 October 2021 via direct emails sent to the population to voluntarily complete a self-administered survey. The email message assured strict anonymity and confidentiality of the collected data and contained an invitation explaining the study objectives and the link to the survey host platform at KAIMRC. The online self-assessed questionnaire instructed participants to respond to the statements concerning socio-demographic information, perceived effect of COVID-19 on some conditions, and questions on the Copenhagen Burnout Inventory (CBI). The CBI measured burnout using three subscales: personal burnout, work-related burnout, and client-related burnout. The score for each CBI domain was the average of its item scores which ranged from 0 to 100. Scores ≥ 50 were considered high-level burnout.

3.4 Survey Validity and Reliability

The original CBI was described as highly consistent with Cronbach's alpha of 0.84 (Kristensen et al., 2005). It was certified in several previous studies as a reliable tool to measure burnout among healthcare workers (Fadare et al., 2021). It was also approved in a pandemic setting, with an alpha coefficient of 0.94 (Talaee et al., 2020), similar to the Cronbach's alpha coefficient in this study (Table 1).

Table 1. Cronbach alpha coefficient

Cronbach Coefficient Alpha	
Variables	Alpha
Raw	0.952347
Standardized	0.954853

3.5 Statistical Techniques

The data was analyzed using Statistical Analysis System SAS 9.4 where several statistical tests were utilized, such as chi-square equality of proportion, ANOVA test, Pearson-correlation test to check for the association between the three burnout domains, and regression tests to evaluate the associations between each independent variable with all the dimensions of burnout. Results were reported using means, standard deviations, percentages and ratios.

3.6 Ethical Consideration

The Ethical Committee at KAIMRC granted the ethical approval number SP21A/158/04 on 08 June 2021.

3.7 Data Security

KAIMRC platforms hosted the study with restricted access to ensure data security and confidentiality.

4. Data Analysis

4.1 Sample Characteristics

A total of 244 participants completed the online questionnaire with no rejected responses. They contained staff from nursing services (61.9 %), medical services (20.5%), laboratory services (7%), pharmaceutical services (6.1%), and Imaging services (4.5%). Most respondents were females (69.3%), (27.4%) aged 35 or less and (72.6%) aged 36 years or more. The majority were married (72.2%), and (65.6%) with more than 10 years of experience (Table 2).

Table 2. Demographics of respondents (n = 244)

		Frequency	Percentage
Gender	Female	169	69.3
	Male	75	30.7
Age	18 – 25	2	.8
	26 – 35	65	26.6
	36 – 45	91	37.3
	46 – 55	71	29.2
	56 – 65	15	6.1
Marital Status	Divorced	11	4.5
	Married	176	72.2
	Single	53	21.7
	Widowed	4	1.6
Department	Laboratory Services	17	7
	Medical Imaging	11	4.5
	Medical Services	50	20.5
	Nursing Services	151	61.9
	pharmaceutical services	15	6.1
Education	Bachelor	158	64.8
	Diploma	41	16.8
	High School	1	.4
	Master	33	13.5
	PhD	11	4.5
Years of Experience	0 – 1	4	1.6
	2 – 5	27	11.1
	6 – 10	53	21.7
	11 – 20	120	49.2
	Above 20	40	16.4

Table 3 displayed that (72.5 %) of the sample worked 12 hours or more per shift, (60.3%) had less than seven days off per month and (51.7%) used to sleep less than 6 hours per night, while (1.2%) slept more than 8 hours per night. Due to COVID-19, (62.3%) reported a great increase in workload, and (72.1%) were required to change normal job duties. (67.6%) had direct contact with COVID-19 patients. (89.8%) of the participants perceived moderate to extreme psychological impact of COVID-19, and (87.7%) feared contracting the infection, while (87.3%) felt worries related to the pandemic, (82.8%) found it difficult to relax, and (64%) felt close to panic during the pandemic.

Table 3. Work conditions of respondents during COVID-19 (n = 244)

	Frequency	Percentage	P-value
1. How many hours (including overtime) do you usually work per shift during COVID-19 pandemic?			
08 Hours	67	27.5	0.00
12 Hours	153	62.7	
16 Hours	9	3.7	
More than 16 Hours	15	6.1	
2. How many off days do you often have per month during COVID-19 pandemic?			
0-3 Days	60	24.6	0.00
4-7 Days	87	35.7	
8-10 days	75	30.7	
11-16 Days	22	9.0	
3. How many hours do you often sleep per night during COVID-19 pandemic?			
1-3 Hours	10	4.1	0.00
4-5 hours	116	47.6	
6-8 Hours	115	47.1	
More than 8 Hours	3	1.2	
4. What is the degree of psychological impact of the COVID-19 pandemic on you?			
A little bit	25	10.2	0.00
Moderate	99	40.6	
Quite a bit	55	22.6	
Extreme	65	26.6	
5. What is the variation in your workload as a result of COVID-19 pandemic?			
No variation	15	6.1	0.00
Decrease	17	7	
Little increase	60	24.6	
Great increase	152	62.3	
6. How often do you have direct Contact with COVID-19 patients?			
Never	29	11.9	0.00
Seldom	50	20.5	
Sometimes	86	35.2	
Often	79	32.4	
7. How often do you feel worries related to COVID-19?			
Never	4	1.6	0.00
Seldom	27	11.1	
Sometimes	95	38.9	
Often	118	48.4	
8. How often do you find it difficult to relax during COVID-19 pandemic?			
Never	11	4.5	0.00
Seldom	31	12.7	
Sometimes	114	46.7	
Often	88	36.1	
9. How often do you feel close to panic during COVID-19 pandemic?			
Never	37	15.2	0.00
Seldom	51	20.8	
Sometimes	109	44.7	
Often	47	19.3	

10. How often you are required to change your normal job duties and activities due to COVID-19?			
Never	37	15.2	0.00
Seldom	31	12.7	
Sometimes	92	37.7	
Often	84	34.4	
11. How often do you feel you are at risk of contracting COVID-19 infection?			
Never	7	2.9	0.00
Seldom	23	9.4	
Sometimes	91	37.3	
Often	123	50.4	

4.2 Research Results (Findings)

Our data revealed several interesting results; however, it did not show any statistical significance regarding the educational level of the sample.

Considering the cut-off CBI scores ≥ 50 , this study registered high levels of total, personal and work-related burnout among the participants. The mean total, personal, work-related, and client-related burnout scores was 55.89 (SD 19.8), 64.8 (SD 22.16), 57.6 (SD 21.05) and 45.2 (SD 24.54), respectively (Table 4).

Table 4. Descriptive statistics of study domains (n=244)

Descriptive Statistics of Study Domains					
	N	Minimum	Maximum	Mean	Std. Deviation
FIRST DOMAIN	244	8.33	100.00	64.8395	22.16440
SECOND DOMAIN	244	7.14	100.00	57.6259	21.05113
THIRD DOMAIN	244	.00	100.00	45.1844	24.54735
TOTAL	244	7.94	97.22	55.8833	19.82008

Note. Table 4 was computed after converting 5-point Likert scale to Numerical Data, scores are ranged from 0-100, and the higher the score the higher level of burnout an employee feels. P-Value was computed using ANOVA.

Table 5 showed a significant correlation between the total level of burnout and the domains of the CBI survey (personal, work-related, client-related burnout).

Table 5. Correlation matrix between the domains and total burnout score

Correlation Matrix Between The Domains and Total score of Burnout Level					
		TOTAL	FIRST DOMAIN	SECOND DOMAIN	THIRD DOMAIN
TOTAL	Pearson Correlation	1	.885**	.912**	.841**
	P-Value		.000	.000	.000
FIRST DOMAIN	Pearson Correlation	.885**	1	.803**	.553**
	P-Value	.000		.000	.000
SECOND DOMAIN	Pearson Correlation	.912**	.803**	1	.626**
	P-Value	.000	.000		.000
THIRD DOMAIN	Pearson Correlation	.841**	.553**	.626**	1
	P-Value	.000	.000	.000	

** Correlation is significant.

Note. The number ranged from 0-1, the higher the number; the stronger the correlation.

4.2.1 Total Burnout

As appeared in table 6, age group 26-36 years scored the highest prevalence of total burnout among age categories

with a mean of 63.22 (SD 17.35), while age group 56–65 had the lowest mean of 36.37 (SD 15.41). Married HCWs reported a lower mean of total burnout as 54.20 (SD 18.31) while single, divorced and widowed HCWs scored higher means starting from 58.40 (SD 25.88). Across Gender, females scored a higher total burnout mean 57.87 (SD19.47) than their males counterparts 51.38 (SD 19.98). Among departments, staff from nursing and laboratory recorded higher means of total burnout as 58.84 (SD 19.34) and 56.43 (SD 19.56), respectively. Participants with work experience more than 20 years had a lower total burnout mean 44.85 (SD 17.44) compared to means starting from 55.66 (SD 20.65) for those with less experience.

Table 6. Analysis of total burnout score with demographics (n=244)

		Mean ± Std. Devi	N	Minimum	Maximum	P-Value
Age	18 – 25	52.38 ± 4.2	2	49.40	55.36	.000
	26 – 35	63.22 ± 17.35	65	25.79	96.43	
	36 – 45	55.83 ± 20.05	91	7.94	97.22	
	46 – 55	53.45 ± 19.63	71	14.68	95.24	
	56 – 65	36.37 ± 15.41	15	13.10	63.29	
Metirnal Status	Divorced	58.40 ± 25.88	11	19.25	94.05	0.1
	Married	54.20 ± 18.31	176	13.10	97.22	
	Single	59.66 ± 22.84	53	7.94	92.66	
	Widowed	72.66 ± 12.63	4	57.54	84.33	
Department	Laboratory Services	56.43 ± 19.56	17	13.10	79.56	0.014
	Medical Imaging	41.64 ± 21.61	11	16.67	83.33	
	Medical Services	51.22 ± 20.93	50	14.68	84.33	
	Nursing Services	58.84 ± 19.34	151	7.94	97.22	
	pharmaceutical services	51.36 ±12.24	15	37.10	82.54	
Education	Bachelor	57.26 ± 19.99	158	7.94	97.22	0.366
	Diploma	54.99 ±19.51	41	17.06	94.05	
	High School	70.83 ± 0	1	70.83	70.83	
	Master	50.00 ± 19.58	33	18.45	92.66	
	PhD	55.66 ± 18.71	11	16.87	83.93	
Years of Experience	0 – 1	58.33 ± 14.72	4	48.61	79.96	0.001
	2 – 5	62.96 ± 27.98	27	27.98	84.72	
	6 – 10	60.92 ± 18.52	53	25.00	96.43	
	11 – 20	55.66 ± 20.65	120	7.94	97.22	
	Above 20	44.85 ±17.44	40	13.10	79.96	
Gender	Female	57.87 ± 19.47	169	8.94	96.43	0.018
	Male	51.38 ± 19.98	75	13.10	97.22	

Note. Tables (6–16) were computed after converting 5-point Likert scale to Numerical Data, scores are ranged from 0–100, and the higher the score the higher level of burnout an employee feels. P-Value was computed using ANOVA.

Table 7 disclosed higher total burnout scores for HCWs who worked 12 hours or more per shift starting from 57.50 (SD 19.43), while HCWs who worked 8 hours had a mean of 49.02 (SD 19.88). Practitioners who had 11–16 days off per month scored lower mean of total burnout as 44.04 (SD 21.31) compared to those who had less days off. Staff who slept 6–8 hours per night scored lower mean of total burnout 49.99 (SD 19.58) in contrast to staff who slept less than 6 hours a day. Staff who had great increase in workload, often had direct contact with COVID-19 cases, or often changed their normal job duties scored higher total burnout means as 62.16 (SD 18.18), 64.12 (SD

20.09), and 66.47 (SD 17.72), respectively. Moreover, higher total burnout prevalence was reported by participants who perceived higher psychological impact of the pandemic 67.54 (SD 16.63), often felt worries related to COVID-19 pandemic 63.33 (SD 19.11), often found it difficult to relax during the pandemic 66.63 (SD 17.38), often felt close to panic during COVID-19 pandemic 70.57 (SD 15.58), and often felt at risk of contracting the infection 64.23 (SD 17.80).

Table 7. Analysis of total Burnout levels with conditions of respondent during COVID-19. (n = 244)

	Mean	N	Std. Deviation	Minimum	Maximum	P-value
1. How many hours (including overtime) do you usually work per shift during COVID-19 pandemic?						
08 Hours	49.0257	67	19.88969	13.10	88.69	0.001
12 Hours	57.5034	153	19.43370	7.94	97.22	
16 Hours	71.6931	9	12.13850	46.23	84.72	
More than 16 Hours	60.5026	15	18.21132	27.78	92.66	
2. How many off days do you often have per month during COVID-19 pandemic?						
0-3 Days	57.3413	60	19.97744	18.45	97.22	0.033
4-7 Days	56.5978	87	20.11133	7.94	96.43	
8-10 days	57.3598	75	18.07335	17.06	95.24	
11-16 Days	44.0476	22	21.31304	14.68	95.24	
3. How many hours do you often sleep per night during COVID-19 pandemic?						
1-3 Hours	64.5040	10	21.04764	31.35	84.72	0.0001
4-5 hours	60.9726	116	18.62830	7.94	95.24	
6-8 Hours	49.9914	115	19.58799	13.10	97.22	
More than 8 Hours	56.2169	3	6.50943	51.79	63.69	
4. What is the degree of psychological impact of the COVID-19 pandemic on you?						
A little bit	42.5873	25	15.06107	13.10	70.83	0.0001
Moderate	51.9400	99	19.57346	14.68	94.05	
Quite a bit	55.2381	55	19.21091	7.94	97.22	
Extreme	67.5488	65	16.63612	34.33	95.24	
5. What is the variation in your workload as a result of COVID-19 pandemic?						
Decrease	36.7530	17	14.15743	17.06	71.03	0.0001
No variation	41.6931	15	22.29636	13.10	79.17	
Little increase	48.9286	60	17.07429	7.94	94.05	
Great increase	62.1684	152	18.18660	22.62	97.22	
6. How often do you have direct Contact with COVID-19 patients?						
Never	43.6440	29	18.08780	7.94	79.17	0.0001
Seldom	49.8690	50	17.08079	14.68	83.93	
Sometimes	55.9408	86	18.46482	16.87	94.05	
Often	64.1200	79	20.09882	16.67	97.22	
7. How often do you feel worries related to COVID-19?						
Never	47.1726	4	18.05692	27.98	70.83	0.0001
Seldom	49.1329	27	17.91734	16.67	84.33	
Sometimes	48.9119	95	18.06290	7.94	92.26	
Often	63.3357	118	19.11737	14.68	97.22	

8. How often do you find it difficult to relax during COVID-19 pandemic?						
Never	66.2338	11	16.23152	42.26	92.26	
Seldom	50.0640	31	20.62152	16.67	84.33	
Sometimes	48.1673	114	17.49604	7.94	94.05	0.0001
Often	66.6351	88	17.38281	19.25	97.22	
9. How often do you feel close to panic during COVID-19 pandemic?						
Never	43.2272	37	17.53314	16.67	84.33	
Seldom	47.0666	51	15.79322	14.68	76.19	
Sometimes	57.9693	109	18.94297	7.94	97.22	0.0001
Often	70.5758	47	16.58673	31.55	96.43	
10. How often you are required to change your normal job duties and activities due to COVID-19?						
Never	43.9940	37	18.64186	7.94	79.96	
Seldom	44.6173	31	17.91919	14.68	79.96	
Sometimes	54.7921	92	17.70674	16.87	97.22	0.0001
Often	66.4730	84	17.72962	30.75	96.43	
11. How often do you feel you are at risk of contracting COVID-19 infection?						
Never	40.2211	7	25.84745	7.94	79.96	
Seldom	42.1756	23	14.81344	16.67	71.03	
Sometimes	49.2587	91	18.04564	13.10	84.33	0.0001
Often	64.2389	123	17.80932	24.80	97.22	

4.2.2 Personal Burnout

The percentage of participants who responded to the first domain questions with always, often and sometimes were combined as the following: 96.89 % felt tired, 95.10 % were physically exhausted, 90.6 % were emotionally exhausted, 75.4 % thought they can't take it anymore, 84.40 % felt worn out, and 76.20 % felt weak and susceptible tillness (Table 8).

Table 8. Respondents distribution for the CBI first domain questions (n=244)

Questions of the First Domain	Always	Often	Sometimes	Seldom	Never	P-Value
1. How often do you feel tired?	79 (32.4%)	77 (31.6%)	80 (32.8%)	7 (2.8%)	1 (0.4%)	0.000
2. How often you are physically exhausted?	77 (31.6%)	79 (32.4%)	76 (31.1%)	9 (3.7%)	3 (1.2%)	0.000
3. How often you are emotionally exhausted?	65 (26.6%)	89 (36.5%)	67 (27.5%)	20 (8.2%)	3 (1.2%)	0.000
4. How often do you think: “I can’t take it anymore?”	48 (19.7%)	54 (22.1%)	82 (33.6%)	33 (13.5%)	27 (11.1%)	0.000
5. How often do you feel worn out?	48 (19.7%)	69 (28.3%)	89 (36.4%)	26 (10.7%)	12 (4.9%)	0.000
6. How often do you feel weak and susceptible tillness?	41 (16.8%)	46 (18.8%)	99 (40.6%)	42 (17.2%)	16 (6.6%)	0.000

Note. Chi-Square Equality of proportion used to compute the P-Value.

Across age categories, age group 26–36 years registered the highest mean of personal burnout as 72.11 (SD 20.89), while age group 56–65 had a mean of 46.11 (SD 15.94). Married HCWs scored a lower mean of personal burnout as 63.35 (SD 21.06) while single, divorced and widowed HCWs scored higher means starting from 66.66 (SD 27.13). Females scored a higher personal burnout mean 68.02 (SD 21.60) than males 54.76 (SD 22.83). Across

professions, staff from nursing department and laboratory scored the highest means of personal burnout as 67.96 (SD 21.36) and 65.44 (SD 21.33), respectively. Participants with work experience more than 20 years had a lower personal burnout mean of 53.85 (SD 16.75) compared to means starting from 65.10 (SD 23.25) for those with experience less than 20 years (Table 9).

Table 9. Analysis of personal burnout score with demographics. (n=244)

		Mean ± Std. Dev	N	Minimum	Maximum	P-Value
Age	18 – 25	60.41± 14.73	2	50.00	70.83	.000
	26 – 35	72.11 ± 20.89	65	16.67	100.00	
	36 – 45	63.82 ± 23.48	91	12.50	100.00	
	46 – 55	63.55 ± 20.37	71	8.33	100.00	
	56 – 65	46.11 ± 15.94	15	25.00	75.00	
Metirnal Status	Divorced	66.66 ± 27.13	11	25.00	100.00	0.059
	Married	63.35 ± 21.06	176	8.33	100.00	
	Single	67.37 ± 24.07	53	12.50	100.00	
	Widowed	91.66 ± 14.02	4	70.83	100.00	
Department	Laboratory Services	65.44 ± 21.33	17	25.00	95.83	0.025
	Medical Imaging	47.72 ± 24.60	11	20.83	100.00	
	Medical Services	60.58 ± 23.5	50	8.33	100.00	
	Nursing Services	67.96 ± 21.36	151	12.50	100.00	
	pharmaceutical services	59.44 ± 17.71	15	29.17	100.00	
Education	Bachelor	66.42 ± 22.01	158	12.50	100.00	0.495
	Diploma	64.43 ± 21.16	41	25.00	100.00	
	High School	62.5 ± 0	1	62.50	62.50	
	Master	60.10 ± 23.57	33	8.33	100.00	
	PhD	57.95 ± 24.25	11	12.50	87.50	
Years of Experience	0 – 1	67.70 ± 15.72	4	50.00	87.50	0.005
	2 – 5	72.99 ± 20.48	27	29.17	100.00	
	6 – 10	68.16 ± 21.98	53	12.50	100.00	
	11 – 20	65.10 ± 23.25	120	8.33	100.00	
	Above 20	53.85 ± 16.75	40	25.00	83.33	
Gender	Female	68.02 ± 216	169	12.5	100.00	0.001
	Male	547.66 ± 22.83	75	8.33	100.00	

Table 10 showed higher means of personal burnout among HCWs who worked 12 hours or more per shift starting from 67.70 (SD 20.94), while HCWs who worked 8 hours had a lower mean of 55.90 (SD 22.52). Practitioners who had 11-16 days off scored a lower mean of personal burnout 53.59 (SD 20.62) compared to those who had less days off per month. Staff who slept 6-8 hours per night scored a lower mean of personal burnout 58.36 (SD 21.19) versus staff who slept less than 6 hours. Staff who had great increase in workload, often had direct contact with COVID-19 cases, or often changed their normal job duties scored higher personal burnout means as 72.67 (SD 19.80), 73.62 (SD 22.61), and 77.38 (SD 17.86) respectively. Nevertheless, a higher personal burnout prevalence was registered among HCWs who perceived increased psychological impact of the pandemic 81.28 (SD 16.48), often felt worries 74.61 (SD 20.22), often found it difficult to relax 77.41 (SD 18.32), often felt close to panic during COVID-19 pandemic 81.11 (SD 19.52), and often felt at risk of contracting the infection 73.47 (SD 19.92).

Table 10. Analysis of personal burnout levels with conditions of respondent during COVID-19. (n=244)

	Mean	N	Std. Deviation	Minimum	Maximum	P-value
1. How many hours (including overtime) do you usually work per shift during COVID-19 pandemic?						
08 Hours	55.9080	67	22.52184	8.33	100.00	0.0001
12 Hours	67.7015	153	20.94423	12.50	100.00	
16 Hours	81.9444	9	15.72882	50.00	100.00	
More than 16 Hours	65.2778	15	23.91840	12.50	100.00	
2. How many off days do you often have per month during COVID-19 pandemic?						
0-3 Days	66.4583	60	24.75664	12.50	100.00	0.099
4-7 Days	65.6609	87	21.15990	12.50	100.00	
8-10 days	65.8889	75	21.02048	8.33	100.00	
11-16 Days	53.5985	22	20.62577	20.83	100.00	
3. How many hours do you often sleep per night during COVID-19 pandemic?						
1-3 Hours	69.1667	10	27.86099	25.00	100.00	0.0001
4-5 hours	70.7615	116	21.23158	8.33	100.00	
6-8 Hours	58.3696	115	21.19206	12.50	100.00	
More than 8 Hours	69.4444	3	10.48588	58.33	79.17	
4. What is the degree of psychological impact of the COVID-19 pandemic on you?						
A little bit	45.1667	25	21.77324	8.33	95.83	0.0001
Moderate	60.2273	99	20.26672	20.83	100.00	
Quite a bit	62.6515	55	19.59209	12.50	100.00	
Extreme	81.2821	65	16.48868	41.67	100.00	
5. What is the variation in your workload as a result of COVID-19 pandemic?						
Decrease	45.0980	17	15.18372	25.00	75.00	0.0001
No variation	48.6111	15	21.16795	20.83	83.33	
Little increase	54.6528	60	20.19636	8.33	100.00	
Great increase	72.6700	152	19.80482	12.50	100.00	
6. How often do you have direct Contact with COVID-19 patients?						
Never	53.3046	29	23.23585	12.50	100.00	0.0001
Seldom	57.9167	50	18.86539	8.33	95.83	
Sometimes	64.6802	86	20.16807	25.00	100.00	
Often	73.6287	79	22.61329	12.50	100.00	
7. How often do you feel worries related to COVID-19?						
Never	34.3750	4	15.72882	12.50	50.00	0.0001
Seldom	51.8519	27	22.20886	8.33	100.00	
Sometimes	57.6754	95	18.89293	12.50	95.83	
Often	74.6116	118	20.22243	16.67	100.00	
8. How often do you find it difficult to relax during COVID-19 pandemic?						
Never	68.1818	11	27.65567	12.50	100.00	0.0001
Seldom	59.0054	31	23.76819	12.50	100.00	
Sometimes	56.3962	114	19.35523	8.33	100.00	
Often	77.4148	88	18.32856	25.00	100.00	

9. How often do you feel close to panic during COVID-19 pandemic?						
Never	49.6622	37	22.66015	8.33	100.00	0.0001
Seldom	55.5556	51	16.98992	16.67	100.00	
Sometimes	67.3165	109	19.92765	12.50	100.00	
Often	81.1170	47	19.52120	12.50	100.00	
10. How often you are required to change your normal job duties and activities due to COVID-19?						
Never	48.5360	37	22.27027	12.50	95.83	0.0001
Seldom	52.1505	31	19.27118	8.33	100.00	
Sometimes	64.2210	92	19.83556	25.00	100.00	
Often	77.3810	84	17.86933	37.50	100.00	
11. How often do you feel you are at risk of contracting COVID-19 infection?						
Never	48.2143	7	29.93600	12.50	95.83	0.0001
Seldom	48.3696	23	17.75514	12.50	75.00	
Sometimes	58.6081	91	20.47660	25.00	100.00	
Often	73.4756	123	19.92749	8.33	100.00	

4.2.3 Work-related Burnout

Table 11. Respondents distribution for the CBI second domain questions (n=244)

Questions of the Second Domain	Always	Often	Sometimes	Seldom	Never	P-Value
1. Is your work emotionally exhausting?	69 (28.3%)	64 (26.2%)	80 (32.8%)	19 (7.8%)	12 (4.9%)	0.000
2. Do you feel burnt out because of your work?	69 (28.3%)	61 (25.0%)	72 (29.5%)	24 (9.8%)	18 (7.4%)	0.000
3. Does your work frustrate you?	48 (19.7%)	43 (17.6%)	83 (34.1%)	35 (14.3%)	35 (14.3%)	0.000
4. Do you feel worn out at the end of the working day?	65 (26.6%)	62 (25.5%)	84 (34.4%)	24 (9.8%)	9 (3.7%)	0.000
5. Are you exhausted in the morning at the thought of another day at work?	44 (18%)	61 (25%)	72 (29.5%)	44 (18%)	23 (9.5%)	0.000
6. Do you feel that every working hour is tiring for you?	43 (17.6%)	51 (20.9%)	74 (30.3%)	53 (21.8%)	23 (9.4%)	0.000
7. Do you have enough energy for family and friends during leisure time?	20 (8.2%)	38 (15.6%)	84 (34.4%)	68 (27.9%)	34 (13.9%)	0.000

The portion of participants responded to the second domain questions with always, often and sometimes were combined as the following: 87.3 % of the participants thought their work is emotionally exhausting, 82.8 % burnt out because of their work, 71.40 % felt their work was frustrating, 86.50 % felt worn out at the end of the working day, 72.50 % felt exhausted in the morning at the thought of another day at work, 68.80 % felt every working hour was tiring, and 58.20 % didn't have energy for family and friends during leisure time (Table 11).

Table 12. Analysis of work related burnout scores with demographics. (n=244)

		Mean ± Std.	N	Minimum	Maximum	P-Value
Age	18 – 25	44.64 ± 12.62	2	35.71	53.57	0.000
	26 – 35	64.34 ± 19.48	65	10.71	92.86	
	36 – 45	57.37 ± 21	91	7.14	100.00	
	46 – 55	56.53 ± 20.67	71	10.71	100.00	
	56 – 65	36.90 ± 16.45	15	14.29	60.71	
Metirnal Status	Divorced	57.79 ± 22	11	21.43	85.71	0.089
	Married	56.12 ± 19.86	176	10.71	100.00	
	Single	60.91 ± 24.22	53	7.14	92.86	
	Widowed	79.46 ± 11.80	4	64.29	92.86	
Department	Laboratory Services	59.24 ± 21.94	17	14.29	92.86	0.109
	Medical Imaging	43.50 ± 24	11	17.86	100.00	
	Medical Services	54.42 ± 22.19	50	10.71	89.29	
	Nursing Services	59.91 ± 20.52	151	7.14	100.00	
	pharmaceutical services	53.80 ± 14.87	15	32.14	89.29	
Education	Bachelor	58.83 ± 21.54	158	7.14	100.00	0.565
	Diploma	55.22 ± 19.48	41	17.86	85.71	
	High School	75 ± 0	1	75.00	75.00	
	Master	53.67 ± 21.15	33	17.86	89.29	
	PhD	59.41 ± 20	11	21.43	89.29	
Years of Experience	0 - 1	56.24 ± 21.10	4	35.71	85.71	0.005
	2 - 5	63.88 ± 16.84	27	32.14	92.86	
	6 – 10	61.92 ± 21.51	53	10.71	100.00	
	11 - 20	57.88 ± 21.25	120	7.14	100.00	
	Above 20	47.05 ± 19.35	40	14.29	85.71	
Gender	Female	59.06 ± 20.99	169	7.14	100.00	0.109
	Male	54.38 ± 20.95	75	14.29	100.00	

Table 12 displayed that age group 26–36 years scored a higher mean of work-related burnout 64.34 (SD 19.48) compared t age group 56–65 with a mean of 36.90 (SD 16.45). Married HCWs recorded a lower mean of work-related burnout as 56.12 (SD 19.86) while single, divorced and widowed HCWs scored higher means starting from 57.79 (SD 22.00). Across Gender, females scored a higher work-related burnout mean of 59.06 (SD 20.99) than males 54.38 (SD 20.95). Staff from nursing department and laboratory scored the highest means of work related burnout as 59.91 (SD 20.52) and 59.24 (SD 21.94), respectively. Participants with work experience more than 20 years had a lower work-related burnout mean of 47.05 (SD 19.35) compared to means starting from 56.24 (SD 21.10) for those with less than 20 years of experience.

Table 13. Analysis of work related burnout levels with work conditions of respondent during COVID-19. (n=244)

	Mean	N	Std. Deviation	Minimum	Maximum	P-value
1. How many hours (including overtime) do you usually work per shift during COVID-19 pandemic?						
08 Hours	50.0000	67	23.21220	10.71	100.00	0.002
12 Hours	60.0373	153	19.88804	7.14	100.00	
16 Hours	70.6349	9	11.40312	42.86	82.14	
More than 16 Hours	59.2857	15	18.15065	25.00	82.14	

2. How many off days do you often have per month during COVID-19 pandemic?						
0-3 Days	58.6905	60	22.55290	10.71	100.00	
4-7 Days	57.3892	87	20.20153	7.14	89.29	0.015
8-10 days	60.8571	75	19.07471	17.86	92.86	
11-16 Days	44.6429	22	22.98090	10.71	92.86	
3. How many hours do you often sleep per night during COVID-19 pandemic?						
1-3 Hours	58.9286	10	24.17869	10.71	82.14	
4-5 hours	63.4852	116	20.04922	7.14	100.00	0.0001
6-8 Hours	51.4596	115	20.31844	10.71	100.00	
More than 8 Hours	63.0952	3	18.32715	42.86	78.57	
4. What is the degree of psychological impact of the COVID-19 pandemic on you?						
A little bit	43.4286	25	21.66732	10.71	100.00	
Moderate	53.9683	99	20.62316	10.71	92.86	0.000
Quite a bit	57.5325	55	21.67705	7.14	100.00	
Extreme	68.7363	65	15.29669	32.14	92.86	
5. What is the variation in your workload as a result of COVID-19 pandemic?						
Decrease	36.9748	17	17.58458	10.71	71.43	0.0001
No variation	42.8571	15	21.59797	10.71	78.57	
Little increase	49.7024	60	18.71766	7.14	92.86	
Great increase	64.5207	152	18.91463	10.71	100.00	
6. How often do you have direct Contact with COVID-19 patients?						
Never	43.7192	29	21.50613	7.14	89.29	
Seldom	51.3571	50	18.66106	10.71	89.29	0.0001
Sometimes	59.6346	86	19.42349	17.86	92.86	
Often	64.5118	79	20.85889	10.71	100.00	
7. How often do you feel worries related to COVID-19?						
Never	50.8929	4	34.30245	21.43	100.00	
Seldom	52.6455	27	18.57335	25.00	85.71	0.0001
Sometimes	50.6391	95	20.72672	7.14	92.86	
Often	64.6186	118	19.29209	10.71	100.00	
8. How often do you find it difficult to relax during COVID-19 pandemic?						
Never	71.4286	11	21.00777	35.71	100.00	
Seldom	52.0737	31	21.75885	17.86	100.00	0.0001
Sometimes	50.0940	114	20.03170	7.14	92.86	
Often	67.6136	88	17.09623	21.43	100.00	
9. How often do you feel close to panic during COVID-19 pandemic?						
Never	44.8842	37	20.85102	10.71	85.71	
Seldom	49.8599	51	20.18992	10.71	92.86	0.0001
Sometimes	60.2228	109	19.92918	7.14	100.00	
Often	70.0608	47	15.92938	32.14	100.00	
10. How often you are required to change your normal job duties and activities due to COVID-19?						
Never	45.2703	37	21.23013	7.14	100.00	
Seldom	47.6959	31	21.85194	10.71	92.86	0.0001
Sometimes	56.6770	92	19.76977	10.71	100.00	
Often	67.7721	84	17.05132	21.43	92.86	

11. How often do you feel you are at risk of contracting COVID-19 infection?

Never	40.3061	7	32.71412	7.14	85.71	
Seldom	49.5342	23	14.81583	17.86	71.43	0.0001
Sometimes	50.4317	91	21.80772	10.71	92.86	
Often	65.4472	123	17.60059	28.57	100.00	

Table 13 showed higher rates of work-related burnout scores among HCWs who worked 12 hours or more per shift starting from 59.28 (SD 18.15), while HCWs who worked 8 hours had a mean of 20.00 (SD 23.21). Practitioners who had 11-16 days off scored a lower mean of work related burnout 44.64 (SD 22.98) compared to those who had less days off per month. Staff who often slept 6-8 hours per night scored a lower mean of work-related burnout 51.45 (SD 20.31) compared to staff who slept less than 6 hours per night. Staff who had great increase in workload, often had direct contact with COVID-19 cases, or who often changed their normal job duties scored a higher work-related burnout mean as 64.52 (SD 18.91), 64.51 (SD 20.85), and 67.77 (SD 17.05), respectively. Furthermore, a higher work related burnout prevalence among our sample was found in the portion who perceived higher psychological impact of the pandemic 81.28 (SD 16.48), often felt worries related to COVID-19 pandemic 68.73 (SD 15.29), never found it difficult to relax 71.42 (SD 21.00), often felt close to panic during COVID-19 pandemic 70.06 (SD 15.92), and often felt at risk of contracting the infection 65.44 (SD 17.60).

4.2.4 Client-related Burnout

The percentage of participants who responded to the third CBI domain questions with always, often and sometimes were combined as the following: 64.80 % found it hard to work with clients, 59.40 % found it frustrating to work with clients, 63.10 % felt that working with clients drain their energy, 73.80 % felt they give more than they get back, 55.70 % were tired of working with clients, and 64.70 % wondered how long they will be able to continue working with clients (Table 14).

Table 14. Respondents distribution for the CBI third domain questions (n=244)

Questions of the Third Domain	Always	Often	Sometimes	Seldom	Never	P-Value
1. Do you find it hard to work with clients?	11 (4.5%)	40 (16.4%)	107 (43.9%)	45 (18.4%)	41 (16.8%)	0.000
2. Do you find it frustrating to work with clients?	15 (6.1%)	28 (11.5%)	102 (41.8%)	52 (21.3%)	47 (19.3%)	0.000
3. Does it drain your energy to work with clients?	18 (7.4%)	34 (13.9%)	102 (41.8%)	53 (21.7%)	37 (15.2%)	0.000
4. Do you feel you give more than you get back when you work with clients?	48 (19.7%)	51 (20.9%)	81 (33.2%)	38 (15.6%)	26 (10.6%)	0.000
5. Are you tired of working with clients?	14 (5.7%)	41 (16.8%)	81 (33.2%)	48 (19.7%)	60 (24.6%)	0.000
6. Do you sometimes wonder how long you will be able to continue working with clients?	28 (11.5%)	39 (16%)	91 (37.2%)	47 (19.3%)	39 (16%)	0.000

Note. Chi-Square Equality of proportion was used to compute the P-Value.

Across age categories, the mean client-related burnout of age group 26–36 years was the highest 53.20 (SD 19.48), while age group 56–65 scored the lowest mean of 26.11 (SD 19.50). Married HCWs scored a mean of client-related burnout as 43.13 (SD 23.20) while single, divorced and widowed HCWs scored higher means starting from 46.87 (SD 30.11). Females scored a higher client-related burnout mean 46.54 (SD 24.35) than males 42.11 (SD 24.86). Across departments, staff from nursing and laboratory scored the highest means of client related burnout as 48.67 (SD 24.67) and 44.60 (SD 23.51), respectively. Participants with work experience more than 20 years had a lower mean of client-related burnout 33.64 (SD 22.35) compared to means starting from 43.99 (SD 25.81) for those with experience less than 20 years (Table 15).

Table 15. Analysis of client related burnout scores with demographics. (n=244)

Client Related Burn out Domain score Level with Demographics						
		Mean ± Std.	N	Minimum	Maximum	P-Value
Age	18 – 25	52.08 ± 14.73	2	41.67	62.50	0.001
	26 – 35	53.20 ± 20.72	65	0.00	100.00	
	36 – 45	46.29 ± 25.05	91	0.00	100.00	
	46 – 55	40.25 ± 25.44	71	0.00	100.00	
	56 – 65	26.11 ± 19.50	15	0.00	58.33	
Metirnal Status	Divorced	50.75 ± 34.45	11	4.17	100.00	0.213
	Married	43.13 ± 23.20	176	0.00	100.00	
	Single	50.70 ± 25.90	53	0.00	100.00	
	Widowed	46.87 ± 30.11	4	8.33	70.83	
Department	Laboratory Services	44.60 ± 23.51	17	0.00	79.17	0.027
	Medical Imaging	33.71 ± 21.03	11	4.17	66.67	
	Medical Services	38.66 ± 25.65	50	0.00	79.17	
	Nursing Services	48.67 ± 24.67	151	0.00	100.00	
	pharmaceutical services	40.83 ± 16.60	15	4.17	62.50	
Education	Bachelor	46.51 ± 24.92	158	0.00	100.00	0.153
	Diploma	45.32 ± 24.56	41	0.00	100.00	
	High School	75 ± 0	1	75.00	75.00	
	Master	36.23 ± 22.40	33	0.00	95.83	
	PhD	49.62 ± 21.52	11	0.00	75.00	
Years of Experience	0 – 1	51.04 ± 16.09	4	33.33	66.67	0.002
	2 – 5	52.00 ± 19.17	27	0.00	87.50	
	11 - 20	43.99 ± 25.81	120	0.00	100.00	
	Above 20	33.64 ± 22.35	40	0.00	83.33	
Gender	Female	46.54± 24.35	169	0.00	100.00	0.193
	Male	42.11± 24.86	75	0.00	100.00	

Table 16 demonstrated higher rates of client-related burnout scores among HCWs who worked 16 hours or more per shift starting from 56.94 (SD 22.85), while HCWs who worked 8 hours had a mean of 41.16 (SD 25.51). Practitioners who had 11-16 days off scored a lower mean of client-related burnout 33.90 (SD 26.95) compared to those who had less days off per month. Staff who used to sleep 3 hours or less scored a higher mean of client-related burnout 65.41 (SD 15.34) compared to those who often slept 4 hours or more per night. HCWs who had great increase in workload, often had direct contact with COVID-19 cases, or who often changed their normal job duties scored higher client-related burnout means as 49.31 (SD 24.91), 54.21 (SD 25.72), and 54.26 (SD 25.53) respectively. Furthermore, a higher client-related burnout prevalence among our sample was found in the portion who perceived higher psychological impact of the pandemic 52.62 (SD 24.40), never felt worries related to COVID-19 pandemic 56.25 (SD 41.45), never found it difficult to relax during the pandemic 59.09 (SD 23.99), often felt close to panic 60.54 (SD 26.10), and often felt at risk of contracting the infection during COVID-19 pandemic 53.79 (SD 24.73).

Table 16. Analysis of client related burnout with conditions of respondent during COVID-19. (n=244)

	Mean	N	Std. Deviation	Minimum	Maximum	P-value
1. How many hours (including overtime) do you usually work per shift during COVID-19 pandemic?						
08 Hours	41.1692	67	25.51575	0.00	100.00	0.02
12 Hours	44.7712	153	24.12357	0.00	100.00	
16 Hours	62.5000	9	15.02313	41.67	87.50	
More than 16 Hours	56.9444	15	22.85797	0.00	95.83	
2. How many off days do you often have per month during COVID-19 pandemic?						
0-3 Days	46.8750	60	23.78924	0.00	100.00	0.152
4-7 Days	46.7433	87	24.95494	0.00	100.00	
8-10 days	45.3333	75	23.54991	0.00	100.00	
11-16 Days	33.9015	22	26.95085	0.00	100.00	
3. How many hours do you often sleep per night during COVID-19 pandemic?						
1-3 Hours	65.4167	10	15.34707	37.50	87.50	0.002
4-5 hours	48.6710	116	23.25815	0.00	100.00	
6-8 Hours	40.1449	115	25.28065	0.00	100.00	
More than 8 Hours	36.1111	3	16.83938	20.83	54.17	
4. What is the degree of psychological impact of the COVID-19 pandemic on you?						
A little bit	39.1667	25	22.72648	0.00	100.00	0.002
Moderate	41.6246	99	24.21891	0.00	100.00	
Quite a bit	45.5303	55	24.59621	0.00	100.00	
Extreme	52.6282	65	24.40224	4.17	100.00	
5. What is the variation in your workload as a result of COVID-19 pandemic?						
Decrease	28.1863	17	22.51202	0.00	66.67	0.001
No variation	33.6111	15	26.13812	0.00	79.17	
Little increase	42.4306	60	20.60599	0.00	100.00	
Great increase	49.3147	152	24.91452	0.00	100.00	
6. How often do you have direct Contact with COVID-19 patients?						
Never	33.9080	29	23.37804	0.00	79.17	0.0001
Seldom	40.3333	50	23.27434	0.00	83.33	
Sometimes	43.5078	86	22.07204	0.00	100.00	
Often	54.2194	79	25.72397	0.00	100.00	
7. How often do you feel worries related to COVID-19?						
Never	56.2500	4	41.45781	0.00	100.00	0.002
Seldom	42.9012	27	21.98165	4.17	83.33	
Sometimes	38.4211	95	22.04105	0.00	91.67	
Often	50.7768	118	25.21247	0.00	100.00	
8. How often do you find it difficult to relax during COVID-19 pandemic?						
Never	59.0909	11	23.99495	16.67	100.00	0.0001
Seldom	39.1129	31	24.24025	0.00	83.33	
Sometimes	38.0117	114	21.47708	0.00	100.00	
Often	54.8769	88	24.80143	0.00	100.00	

9. How often do you feel close to panic during COVID-19 pandemic?

Never	35.1351	37	21.23548	0.00	75.00	0.0001
Seldom	35.7843	51	21.21609	0.00	75.00	
Sometimes	46.3685	109	22.94191	0.00	100.00	
Often	60.5496	47	26.10555	0.00	100.00	

10. How often you are required to change your normal job duties and activities due to COVID-19?

Never	38.1757	37	25.31654	0.00	100.00	0.0001
Seldom	34.0054	31	21.59970	0.00	83.33	
Sometimes	43.4783	92	21.56945	0.00	91.67	
Often	54.2659	84	25.53786	0.00	100.00	

11. How often do you feel you are at risk of contracting COVID-19 infection?

Never	32.1429	7	26.32092	0.00	62.50	0.0001
Seldom	28.6232	23	22.69362	0.00	70.83	
Sometimes	38.7363	91	19.97775	0.00	79.17	
Often	53.7940	123	24.73107	0.00	100.00	

5. Discussions*5.1 Preface*

Christensen et al. (2005) classified burnout into three forms based on probable causes, personal, work-related and client-related. They correlated personal burnout to personal and subjective issues, work-related burnout with factors of the work environment and conditions, and patient-related burnout to emotional involvement in a patient's complications.

In this study, the mean of personal burnout was the highest of the three CBI domains at 64.8, followed by work-related burnout at 57.6, then client-related burnout at 45.2. This trend occurred in other studies that utilized the CBI instrument. In their study among urology residents in KSA, Al Juhayman et al. (2020) estimated the mean of personal burnout, work-related burnout and client-related burnout as 57.92, 55.26, and 37.73, respectively. Another study among Malaysian HCWs reported that the overall prevalence of the above burnout domains was 53.8%, 39.1%, and 17.4%, respectively (Roslan et al., 2021). In contrast to the above tendency, some studies registered higher levels of client-related burnout than the other two domains. Khasne et al. (2020) evaluated the means of the above burnout domains among Indian HCWs as 49.72 (± 18.68), 39.69 (± 20.43), and 51.37 (± 15.12), respectively. While some other studies reported higher means of work-related burnout than the other two domains. Clinton et al. (2021) estimated the means of personal burnout among Lebanese pharmacists as 58.87, work-related burnout at 59.28, and client-related burnout at 46.71.

5.2 Personal Burnout

In line with previous studies, this research found some factors to be independent predictors of higher personal burnout, such as younger age and fewer years of experience, suggesting that the probability of high burnout appeared to diminish with increasing age and experience, implying that aging and gaining experience was a protective factor against burnout. Some studies found that older workers were better at employing positive adaptive and emotion control abilities acquired from life experiences. This made them more engaged in the job and less burned out when faced with stressful conditions (Fadare et al., 2021). Our findings also associated female gender and single status with higher rates of personal burnout relative to their male and married counterparts. Similarly, Khasne et al. (2020) reported a higher burnout prevalence among females than males, with an odds ratio of 1.4. According to Duarte et al. (2020), the average personal burnout rates in women were 4.5 points higher than in men. An explanation for these results might be due to reasons associated with burnout, such as differences in distress rates among genders. Al Hanawi et al. (2020) reported that females were more likely to be severely distressed than males. Albert (2015) indicated that some threat elements for distress in females were possible because of a genetic cause, like instabilities in their hormones. Furthermore, Estry Behar et al. (2011) argued that women appeared to suffer from sleep quality disorders compared to males. Also, they had more difficulties balancing professional commitments and home responsibilities, and those compound roles might have caused a

greater vulnerability of burnout among females. On the other hand, Roslan et al. (2021) suggested that families might serve as social support for HCWs, and good social decreased the risk of developing burnout. Therefore, married HCWs showed lower rates of burnout than single workers. In contrast to the above findings that indicated increased female and single HCWs vulnerability to burnout, some studies found higher personal burnout rates among males (Al Juhayman et al., 2020) and married HCWs (Duarte et al., 2020). This study showed higher levels of burnout among nursing staff compared to other professionals. Likewise, Chor et al. (2020), in their research to assess burnout among emergency HCWs during the pandemic in Singapore, estimated a higher percentage of nurses (53.3%) perceiving burnout versus doctors (42.5%). Several studies have confirmed that nurses were prone to greater levels of stress-related burnout than other HCWs because of the type of work that required continuous emotional involvement with patients and their complications and due to lack of social support (Giorgi et al., 2020). Also, the Job title might function as a sign of work demands and control. Excessive demands with little control plus low support at the workplace were significant elements linked to higher burnout risk (Aronsson et al., 2017). However, expatriate nurses formed the majority of the workforce, and being away from their families during difficult times might cause mixed emotions that lead to burnout (Al Qahtani et al., 2019). Similar to nursing in this study, medical laboratory participants scored high levels of burnout. The COVID-19 outbreak caused an acute increase in the volume of screens and lab tests that impacted the workload of laboratory staff. Research from Tokyo revealed that medical laboratory teams were more likely to develop burnout by 6.1 times than physicians (Matsuo et al., 2019). In their study, Roslan et al. (2020) found that pharmacists had the highest personal burnout scores among other HCWs. During the pandemic, (51.7%) of our participants slept less than six hours per night, while (1.2%) slept more than eight hours per night (Table 3). Weishan et al. (2015) adversely associated the length of sleep with the start of burnout. In other words, sleeping more time per working day was linked to lower chances of developing burnout amongst HCWs. Yet, it was strange to record higher personal burnout and work-related burnout among individuals who slept more than eight hours per night than those who slept less than six hours per night (Tables 10 and 13). Giorgi et al. (2017) suggested that sleep disorder, subjective sleep and dysfunction during the daytime had a remarkable positive relationship with the values of the overall burnout while being primarily correlated to personal burnout. Weishan et al. (2015) linked burnout to sleeping with plateau phenomena at a sleeping length of more than seven hours or less than five hours. According to Max et al. (2020), the cause of plateau phenomena was irregularities in the ventilation rates or the body's inability to carry or consume O₂.

Table 7 showed severe levels of personal burnout for participants who reported some anxiety in the form of worries, fear and panic related to COVID-19. Duarte et al. (2020) pointed that high anxiety was a significant factor of personal burnout. According to Kristensen et al. (2005), anxiety appeared as a risk factor for personal burnout but not work-related or client-related burnout.

5.3 Work-Related Burnout

Consistent with other studies, factors such as long working hours, increased workload, fewer off days, direct contact with COVID-19 cases, change in regular duties, and fear of contracting the disease contributed independently to burnout levels, especially work-related burnout. Al Sulaimani et al. (2020) concluded that working extended hours per shift was associated with higher levels of work-related burnout. An explanation might be because lengthier working hours indicated longer acquaintance with work-related stressors that caused burnout, such as prolonged contact with patients, use of PPE, and sleep deficiency. According to Ro-ting et al. (2021), the amount of working time was associated positively with work-related burnout and negatively with the average number of sleeping hours. They argued that the number of sleeping hours was an intermediary for the correlation between the working time and burnout among HCWs because longer working hours implied that workers spent much time at work; thus, time available for sleep might decrease. They found that employees who used to work sixty hours or more weekly had twice greater odds ratio of work-related burnout than those who worked forty hours or less per week. The odds climbed three times with an average of seventy-four working hours per week, and it increased to four times when working hours exceeded eighty-four hours. Therefore, any decrease in average working time might protect HCWs from burnout. Sklar et al. (2021) concluded that change in duty was associated positively with work-related burnout, and more reported burnout was associated positively with more intentions to turnover. Ferry et al. (2020) revealed that HCWs reassigned from their regular work area to a place dedicated to treating COVID-19 infected patients had twice the risk of suffering moderate to severe burnout. Wisetborisut et al. (2014) found that nurses who worked shifts and used to have eight days off or more per month had fewer signs of burnout than those who had fewer than eight days off. In this study, it was strange that the respondents who had 8–10 days off per month scored a higher level of work-related burnout than those who had 1-3 days off per month (Table 13). Although the COVID-19 pandemic disturbed healthcare organizations worldwide and increased the demand for medical services, other risk factors such as social and personal stressors might enforce extra pressures

and influence the level of burnout. According to Adams et al. (2020), personal life concerns interfering with work or vice versa frequently caused burnout among HCWs. Roslan et al. (2020) disclosed that HCWs struggled to balance their work obligations and family life while providing health care during the pandemic and worried about infecting their families when they approached home.

5.4 Client-Related Burnout

In this study, the mean score of client-related burnout was the lowest among the CBI domains, which is not viewed as high considering the CBI cut-off point for high burnout (50 and above). However, younger participants with less work experience, worked 16 hours per shift, slept fewer hours per working day and had direct contact with COVID-19 cases or changed their regular job duties experienced higher levels of client-related burnout (Tables 15 & 16). The above findings were consistent with other studies that found younger HCWs, less experienced, and who had direct involvement with COVID-19 infected patients were associated significantly with a higher prevalence of patient-related burnout (Roslan et al., 2020). A study in China also suggested that HCWs caring for COVID-19 infected patients had about twice the risk of developing psychological disorders and were more vulnerable to depression, anxiety, fatigue, and burnout than staff who hardly contacted infected patients (Wang Lu et al., 2020). The increase in workload and change in regular job duties were associated with a higher prevalence of client-related burnout among HCWs, according to Al Juhyma et al. (2020). Here, participants who slept fewer hours had higher scores of client-related burnouts. Similarly, some studies found nurses who had less than six hours of sleep per night were more likely to experience job strain and client-related burnout than those who had more than seven hours of sleep in a linear relationship (Weishan et al., 2015). Khasne et al. (2020) revealed that Physicians were 1.65 times more likely to suffer client-related burnout than the administrative staff. They also indicated that HCWs in hospital locations set for treating infected individuals showed a higher frequency of client-related burnout and feared contracting and transmitting the disease to their families or dying at the workplace.

6. Summary, Conclusion & Recommendations, and Limitations

6.1 Summary

Psychological exhaustion, cynicism, and inefficacy were the characteristics of burnout experienced in response to emotionally chronic job stressors. COVID-19 increased work demands and unmanaged stress that could result in HCWs' burnout. Burnout was highly prevalent in the clinical field and has attracted much attention, given the associated dramatic adverse outcomes, such as the profound impact on cost and quality of healthcare delivery and negative consequences on HCWs' physical and mental health. Leiter and Maslach (2004) described the opposite of burnout as work engagement characterized by energy, involvement and efficacy versus exhaustion, cynicism and inefficacy. According to the CBI, this study showed high personal and work-related burnout among HCWs at KAH during the COVID-19 pandemic. Factors contributed to burnout included younger age, female gender, the nursing profession, fewer years of experience, extended working hours per shift, fewer days off per month, fewer hours of sleep per night, increased workload, prolonged contact with COVID-19 cases, change in regular job duties and the higher perceived psychological impact of the pandemic.

6.2 Conclusion and Recommendations

This study highlighted the prevalence of burnout experienced among healthcare workers at KAH during the COVID-19 pandemic. These findings pointed to the importance of prevention and management strategies to address occupational burnout at the institutional level. Hofmeyer et al. (2020) recommended several evidence-based administrative approaches to reduce burnout and promote job engagement, such as recognizing and evaluating the problem, employing the rule of effective leadership, facilitating target interferences, using compensations wisely, and promoting values and resilience culture. Furthermore, some organizations activated peer supporting programs, regular meetings, and psychiatric helplines to address the mental health issues of HCWs facing overstrains (Greenberg et al., 2020).

6.3 Limitations

This study yielded significant findings. However, it considered some limits. First, though the current study controlled some potential factors widely used in the HCWs burnout literature, other stressful factors in life influenced the burnout outcomes this study did not control. Second, difficult to compare the results of burnout studies, especially among countries, due to differences in culture, health care systems, assessment scales and study designs. Third, our findings might not imply causality, because participants were from a single hospital.

Acknowledgements

This is to acknowledge the technical support received from King Abdullah International Research Center (KAIMRC). Particularly, promoting and hosting the data on their platforms.

Competing Interests Statement

The authors declare that there are no competing or potential conflicts of interest.

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Appendix

- Survey Tool: CBI
- IRB approval

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