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Mental Health Problems and Burnout among Healthcare Workers in Brunei Darussalam During the COVID-19 Pandemic

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Abstract

Introduction: The COVID-19 pandemic significantly impacted the mental health and wellbeing of healthcare workers worldwide. This study examined the prevalence and predictors of self-reported mental health problems, specifically depression, anxiety, stress, and burnout among government healthcare professionals in Brunei Darussalam during the second and subsequent waves of the pandemic. **Materials and Methods**: A cross-sectional online survey was distributed to all government healthcare workers employed by the Ministry of Health in Brunei Darussalam. The survey collected sociodemographic information and applied two validated tools: the Depression Anxiety Stress Scale 21-item version (DASS-21) to assess the depression, anxiety, and stress, and the Oldenburg Burnout Inventory (OLBI) to measure burnout. **Results**: Of 1,759 invited healthcare workers, 704 responded (response rate 40.0%). The prevalence of common mental health problems and burnout were 32.4% and 71.7%, respectively. Older age was protective against common mental health problems. Performing clinical duties outside one's training scope, and direct involvement in managing COVID-19 patients were significant predictors of common mental health problems. Expatriate staff had significantly lower odds of burnout compared to Bruneian nationals. Shift work and additional administrative duties independently predicted burnout. A history of mental health problems and difficulty accessing mental health support were strongly associated with both outcomes. **Conclusions**: This study identified a substantial burden of depression, anxiety, stress, and burnout among government healthcare professionals in Brunei Darussalam, with distinct vulnerable subgroups. These findings highlight the need for targeted mental health interventions, improved access to support services, and systemic workplace strategies to safeguard the wellbeing of the healthcare workforce.

Keywords: Brunei Darussalam; Burnout; COVID-19; Depression Anxiety Stress Scale-21 (DASS-21); Oldenburg Burnout Inventory (OLBI); Healthcare Workers; Mental health

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INTRODUCTION

The COVID-19 pandemic, caused by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), was declared a Public Health Emergency of International Concern by the World Health Organisation (WHO) on 20th January 2020. The first outbreak was identified in Wuhan, China in December 2019 and was subsequently declared a pandemic by the WHO on 11th March 2020. As of May 2025, over 778 million cases and 7.1 million deaths had been reported globally.[1]

The prolonged pandemic adversely affected the world socially and economically, contributing to a rise in mental health problems across the general population. In the healthcare sector, the strain on health systems and changes in working practices, such as unexpected redeployments, extended working hours, and the rapid adoption of teleconsultations, significantly impacted the mental health and wellbeing of healthcare workers worldwide.[2,3]

Numerous studies have highlighted the heightened vulnerability of healthcare workers to psychological distress, burnout, and anxiety during the pandemic, emphasising the need for healthcare organisations to proactively identify, manage, and support the wellbeing of their workforce.[5,6] Brunei Darussalam was equally affected, recording its first COVID-19 case in March 2020.[4] A study examining the wellbeing and burnout of doctors and dentists during the first wave in Brunei Darussalam revealed that 21.5% had common mental health disorders, with 85.3% experiencing high or moderate levels of burnout.[5] Since then, Brunei faced successive waves of the pandemic, placing heightened and sustained demands on its healthcare system and workforce.

Building on this earlier work, this study aimed to estimate the prevalence of depression, anxiety, stress, and burnout among a broader cohort of government healthcare workers in Brunei Darussalam during the second and subsequent waves of the COVID-19 pandemic. Specifically, the study aimed to: (1) determine the prevalence of common mental health problems and burnout among government healthcare workers employed by the Ministry of Health; (2) identify sociodemographic, professional, and workplace factors associated with these outcomes; and (3) examine the role of mental health history and access to mental health support as predictors of psychological distress and burnout.

MATERIALS AND METHODS

Study design: This was a cross-sectional study estimating the prevalence of depression, anxiety, stress, and burnout among government healthcare workers in Brunei Darussalam. It was a follow-up to a previous study of doctors and dentists conducted after the first wave of COVID-19 in Brunei Darussalam,[5] with the scope expanded to include all government healthcare workers.

Study sample: Participants were healthcare workers employed by the Ministry of Health in Brunei, including doctors, dentists, nurses, and Allied Health Professionals registered with Bruneian regulatory boards. Allied Health Professionals comprise 19 professions regulated by the Allied Health Professions Council of Brunei Darussalam (AHPCBD).[7]

Data collection procedure: In June 2022, invitations to participate in an anonymous online survey via KoboToolbox were sent to registered healthcare workers through their respective professional boards. Separate survey links were provided in English and Bahasa Melayu. A reminder was sent by email and workplace WhatsApp groups two weeks before the closing date. Participants were asked to complete the survey once only. The survey introduction outlined the study objectives, and affirmed anonymity and confidentiality. Participation was voluntary and participants were encouraged to proceed only if they were comfortable with the stated terms.

Data collection: The survey was adapted from a previous study conducted in 2021,[5] and collected sociodemographic information and psychiatric history. The Bahasa Melayu version underwent face validation by Malay-speaking members of the research team. Throughout the survey, the term COVID-19 was used in place of SARS-CoV2, as it is more widely recognised in public settings. A "recent" mental health problem was defined as one occurring within the past year, from June 2021 onwards.[8]

Depression, anxiety, and stress were assessed using the Depression, Anxiety and Stress Scale 21-item version (DASS-21), available in both English and Bahasa Melayu.[9,10] Both versions have been validated for use in non-clinical adult populations.[11] Burnout was assessed using the Oldenburg Burnout Inventory (OLBI) also available in both languages.[12-14] The original English versions of both tools are freely available in the public domain, and written permission was obtained to use the Malay translations. Bahasa Melayu is the standardised form of the Malay language and serves as the primary language for formal communication in Brunei.[15]

Scores were calculated automatically by the

KoboToolbox platform upon completion of each tool. A DASS-21 score of 34 or above indicated the presence of common mental health problems, and an OLBI score of 35 or above indicated burnout, based on validated cut-off values.[9,16] Participants' perceptions of the factors contributing to poor mental health and burnout, and suggestions for improvement, were also collected and are summarised in **Appendix 1**.

Statistical analysis: Data were analysed using SPSS version 25 and R software version 4.6.0. DASS-21 and OLBI scores were each dichotomised: scores of 34 and above versus below 34 for common mental health problems, and 35 and above versus below 35 for burnout. Descriptive statistics were used to characterise the sample, and chi-square tests examined associations between variables and each outcome. Binary logistic regression was used to identify independent predictors of both outcomes, with odds ratios reported alongside 95% confidence intervals. Variables that showed a statistically significant association with either outcome on chi-square testing ($p<0.05$) were entered in the binary logistic regression model. Multicollinearity between predictor variables was assessed using Variance Inflation Factors; no variable exceeded a VIF of 10, indicating that multicollinearity was not a significant concern. Model fit was assessed using the Hosmer-Lemeshow goodness-of-fit test, with a non-significant result indicating acceptable fit.

Ethical considerations: Ethical approval was granted by the Medical and Health Research Ethics Committee (MHREC) of the Ministry of Health, Brunei Darussalam (reference: MHREC/MOH/2022/10(3)).

RESULTS

Participants Characteristics: Overall, 704 responded out of 1,759 invitations sent to government healthcare workers, giving a response rate of 40.0%. The majority of participants were Brunei nationals (82.4%), female (79.7%), and married (66.3%). The largest age group was 30 to 39 years (35.2%). Nearly two fifths (38.9%) had children aged 5 to 18 years, and most had family members residing in Brunei (91.2%) (**Table I**).

Nurses made up the largest professional group (67.8%), followed by medical doctors (18.9%), allied health professionals (9.9%), and dentists (3.4%). Medical officers (65.6%) and staff nurses (74.3%) were the most common grades within their respective professions. Over half of the participants (51.7%) had more than 10 years of experience working in Brunei's healthcare system. Most were hospital-based (72.6%), with an almost equal split between those working office hours (50.1%) and shifts (49.9%). A small proportion (16.3%) were enrolled in postgraduate training programmes.

Table I: Sociodemographic factors associated with common mental health problems and burnout among healthcare workers (N=704).

Variable	Overall *n* (%)*	DASS-21 *n* (%)	*p*-value	OLBI *n* (%)	*p*-value
Gender					
Female	561 (79.7)	192 (34.2)	0.053	422 (75.2)	**0.001**
Male	139 (19.7)	35 (25.2)		79 (56.8)	
Age group (years)					
20–29	164 (23.3)	99 (60.4)	**0.001**	147 (89.6)	**0.001**
30–39	248 (35.2)	73 (29.4)		189 (76.2)	
40–49	192 (27.3)	46 (24.0)		125 (65.1)	
≥50	100 (14.2)	10 (10.0)		44 (44.0)	
Marital status					
Married	467 (66.3)	123 (26.3)	**0.001**	316 (67.7)	**0.001**
Not married	237 (33.7)	105 (44.3)		189 (79.7)	
Children below 5 years					
No	541 (76.8)	183 (33.8)	0.193	381 (70.4)	0.125
Yes	161 (22.9)	45 (28.0)		124 (77.0)	
Children aged 5–18 years					
No	430 (61.1)	156 (36.3)	**0.007**	320 (74.4)	0.058
Yes	274 (38.9)	72 (26.3)		185 (67.5)	
Family members residing in Brunei					
Yes	642 (91.2)	216 (33.6)	**0.031**	481 (74.9)	**0.001**
No	62 (8.8)	12 (19.4)		24 (38.7)	
Nationality					
Bruneian	580 (82.4)	210 (36.2)	**0.001**	460 (79.3)	**0.001**
Expatriate	124 (17.6)	18 (14.5)		45 (36.3)	

Chi-square test for independence. Bold *p*-values indicate statistical significance at $p<0.05$. Percentages are based on the total sample (N=704). Four participants did not disclose gender ("prefer not to disclose" or "other") and two did not respond to the question on children below five years of age; these represent less than 1% of the sample. DASS-21 = Depression Anxiety Stress Scale 21-item version; OLBI = Oldenburg Burnout Inventory.

The pandemic had a considerable impact on participants' working lives. Over a third (33.8%) took on additional duties, around half (51.4%) reported performing clinical duties outside their usual scope of practice, and 59.2% took on additional administrative responsibilities. The majority were directly involved in managing COVID-19 patients (79.7%), and 67.2% reported workplace changes due to the pandemic. Only 25.1% felt their workplace was very well prepared for these changes (**Table II**).

Mental Health and Substance Use Characteristics: A substantial proportion of participants reported a history of mental health problems. These were self-reported and were not specifically attributed to COVID -19 in the survey; they may therefore reflect pre-existing difficulties, pandemic-related distress, or both. In total, 47.0% reported mental health problems more than a year ago, 60.1% within the past year, and 30.3%

Table II: Professional and workplace factors associated with common mental health problems and burnout among healthcare workers (N=704).

Variable	Overall *n* (%)	DASS-21 ≥34 *n* (%)	*p*-value	OLBI ≥35 *n* (%)	*p*-value
Profession					
Medical doctor	133 (18.9)	42 (31.6)	0.112 for trend	72 (54.1)	**<0.001** for trend
Dentist	24 (3.4)	13 (54.2)		23 (95.8)	
Nurse	477 (67.8)	148 (31.0)		353 (74.0)	
Allied health professional	70 (9.9)	25 (35.7)		57 (81.4)	
Medical doctors by grade (*n*=131)					
Foundation year doctor	6 (4.6)	3 (50.0)	0.440 for trend	4 (66.7)	0.323 for trend
Medical officer	86 (65.6)	27 (31.4)		47 (54.7)	
Senior medical officer	18 (13.7)	6 (33.3)		10 (55.6)	
Associate specialist	13 (9.9)	2 (15.4)		4 (30.8)	
Consultant	8 (6.1)	4 (50.0)		6 (75.0)	
Dentists by grade (*n*=24)					
Dental trainee	5 (20.8)	3 (60.0)	0.908 for trend	5 (100.0)	0.628 for trend
Dental officer	9 (37.5)	4 (44.4)		8 (88.9)	
Senior dental officer	5 (20.8)	3 (60.0)		5 (100.0)	
Dental consultant	5 (20.8)	3 (60.0)		5 (100.0)	
Nurses by grade (*n*=475)					
Assistant nurse	80 (16.8)	29 (36.2)	0.063 for trend	67 (83.8)	**0.013** for trend
Staff nurse	353 (74.3)	114 (32.3)		258 (73.1)	
Special grade staff nurse	19 (4.0)	3 (15.8)		15 (78.9)	
Nursing officer	18 (3.8)	2 (11.1)		8 (44.4)	
Senior nursing officer	5 (1.1)	0 (0.0)		4 (80.0)	
Allied health professionals by grade (*n*=70)					
Officer	58 (82.9)	22 (37.9)	0.603	49 (84.5)	0.300
Senior officer	12 (17.1)	3 (25.0)		8 (66.7)	
Duration working in Brunei (years)					
< 2	103 (14.6)	38 (36.9)	**0.001** for trend	70 (68.0)	**0.003** for trend
2–5	125 (17.8)	68 (54.4)		103 (82.4)	
6–10	112 (15.9)	38 (33.9)		88 (78.6)	
> 10	364 (51.7)	84 (23.1)		244 (67.0)	
Workplace setting					
Hospital based	511 (72.6)	177 (34.6)	**0.047**	370 (72.4)	0.581
Community or health centre based	193 (27.4)	51 (26.4)		135 (69.9)	
Enrolled in postgraduate training					
No	589 (83.7)	180 (30.6)	**0.025**	419 (71.1)	0.496
Yes	115 (16.3)	48 (41.7)		86 (74.8)	
Performing additional duties					
No	466 (66.2)	143 (30.7)	0.206	332 (71.2)	0.753
Yes	238 (33.8)	85 (35.7)		173 (72.7)	
Working pattern					
Office hours	353 (50.1)	103 (29.2)	0.081	239 (67.7)	**0.022**
Shift work	351 (49.9)	125 (35.6)		266 (75.8)	
Clinical duties outside training scope					
No	342 (48.6)	84 (24.6)	**0.001**	213 (62.3)	**0.001**
Yes	362 (51.4)	144 (39.8)		292 (80.7)	
Additional administrative duties					
No	287 (40.8)	77 (26.8)	**0.011**	165 (57.5)	**0.001**
Yes	417 (59.2)	151 (36.2)		340 (81.5)	
Direct management of COVID-19 patients					
No	143 (20.3)	29 (20.3)	**0.001**	94 (65.7)	0.093
Yes	561 (79.7)	199 (35.5)		411 (73.3)	
Workplace changes due to COVID-19					
No	231 (32.8)	61 (26.4)	**0.022**	145 (62.8)	**0.001**
Yes	473 (67.2)	167 (35.3)		360 (76.1)	
Perceived workplace preparedness for COVID-19					
Not prepared at all	25 (3.6)	14 (56.0)	**0.001 for trend**	21 (84.0)	**0.001 for trend**
Not very well prepared	131 (18.6)	51 (38.9)		114 (87.0)	
Somewhat prepared	371 (52.7)	130 (35.0)		282 (76.0)	
Very well prepared	177 (25.1)	33 (18.6)		88 (49.7)	

Chi-square test for independence. Bold *p*-values indicate statistical significance at $p<0.05$. Percentages within grade sub-sections are calculated from the number of valid grade responses for that profession (shown in parentheses in section header). Doctor grades: *n*=131 (2 missing); Nurse grades: *n*=475 (2 missing). DASS-21 = Depression Anxiety Stress Scale 21-item version; OLBI = Oldenburg Burnout Inventory. Common mental health problems defined as DASS-21≥34 and burnout as OLBI ≥ 35. Data are presented as n(%) of participants meeting the respective cut-off criteria.

were uncommon – only 4.1% had received one more than a year ago and 3.3% within the past year. Most participants rated access to mental health support as "neither easy nor difficult" (46.6%), though 32.1% reported some degree of difficulty.

Thoughts of self-harm in the past year were reported by 11.6% of participants, with 2.7% reporting an attempt. Suicidal ideation in the past year was reported by 9.9%, with 0.7% reporting a suicide attempt. Similar rates were observed for the period of more than a year ago, with 9.8% reporting thoughts of self-harm, and 8.8% reporting suicidal thoughts. Substance and alcohol misuse were infrequent across both time periods (**Table III**).

Prevalence of Depression, Anxiety, Stress, and Burnout: Using the DASS-21, 38.2% of participants reported some degree of depression, including 5.7% classified as extremely severe. Anxiety of at least mild severity was reported by 41.1%, with 10.7% in the extremely severe range. Stress was less prevalent, with 26.7% reporting mild to severe levels, and 2.6% extremely severe. Overall, 32.4% (*n*=228) of the participants met the threshold for common mental health problems (DASS-21 score ≥34), and 71.7% (*n*=505) met the threshold for burnout (OLBI score ≥35) (**Table IV**).

Table III: Mental health history and substance use factors associated with common mental health problems and burnout among healthcare workers (N=704).

Variable	Overall *n* (%)	DASS-21 ≥34 *n* (%)	*p*-value	OLBI ≥35 n (%)	*p*-value
Mental health problems more than 1 year ago					
No	373 (53.0)	67 (18.0)	**0.001**	210 (56.3)	**0.001**
Yes	331 (47.0)	161 (48.6)		295 (89.1)	
Mental health problems in the past year					
No	281 (39.9)	26 (9.3)	**0.001**	129 (45.9)	**0.001**
Yes	423 (60.1)	202 (47.8)		376 (88.9)	
Mental health problems in the past week					
No	491 (69.7)	81 (16.5)	**0.001**	309 (62.9)	**0.001**
Yes	213 (30.3)	147 (69.0)		196 (92.0)	
Formal mental health diagnosis more than 1 year ago					
No	675 (95.9)	205 (30.4)	**0.001**	477 (70.7)	**0.005**
Yes	29 (4.1)	23 (79.3)		28 (96.6)	
Formal mental health diagnosis in the past year					
No	681 (96.7)	208 (30.5)	**0.001**	483 (70.9)	**0.019**
Yes	23 (3.3)	20 (87.0)		22 (95.7)	
Thoughts of self-harm more than 1 year ago					
No	635 (90.2)	174 (27.4)	**0.001**	438 (69.0)	**0.001**
Yes	69 (9.8)	54 (78.3)		67 (97.1)	
Thoughts of self-harm in the past year					
No	622 (88.4)	158 (25.4)	**0.001**	426 (68.5)	**0.001**
Yes	82 (11.6)	70 (85.4)		79 (96.3)	
Attempted self-harm in the past year					
No	685 (97.3)	210 (30.7)	**0.001**	486 (70.9)	**0.012**
Yes	19 (2.7)	18 (94.7)		19 (100.0)	
Suicidal ideation more than 1 year ago					
No	642 (91.2)	178 (27.7)	**0.001**	445 (69.3)	**0.001**
Yes	62 (8.8)	50 (80.6)		60 (96.8)	
Suicidal ideation in the past year					
No	634 (90.1)	170 (26.8)	**0.001**	437 (68.9)	**0.001**
Yes	70 (9.9)	58 (82.9)		68 (97.1)	
Suicide attempt in the past year					
No	699 (99.3)	223 (31.9)	**0.006**	500 (71.5)	0.363
Yes	5 (0.7)	5 (100.0)		5 (100.0)	
Access to mental health support at workplace					
Extremely easy	46 (6.5)	4 (8.7)	**0.001** for trend	16 (34.8)	**0.001** for trend
Moderately easy	104 (14.8)	13 (12.5)		57 (54.8)	
Neither easy nor difficult	328 (46.6)	96 (29.3)		245 (74.7)	
Moderately difficult	109 (15.5)	47 (43.1)		88 (80.7)	
Extremely difficult	117 (16.6)	68 (58.1)		99 (84.6)	
Substance misuse more than 1 year ago					
No	695 (98.7)	223 (32.1)	0.256	496 (71.4)	0.128
Yes	9 (1.3)	5 (55.6)		9 (100.0)	
Substance misuse in the past year					
No	701 (99.6)	226 (32.2)	0.514	502 (71.6)	0.655
Yes	3 (0.4)	2 (66.7)		3 (100.0)	
Alcohol misuse more than 1 year ago					
No	695 (98.7)	222 (31.9)	0.064	497 (71.5)	0.437
Yes	9 (1.3)	6 (66.7)		8 (88.9)	
Alcohol misuse in the past year					
No	700 (99.4)	225 (32.1)	0.197	501 (71.6)	0.482
Yes	4 (0.6)	3 (75.0)		4 (100.0)	

Continuation of Table III.

Chi-square test for independence. Bold *p*-values indicate statistical significance at $p<0.05$. DASS-21 = Depression Anxiety Stress Scale 21-item version; OLBI = Oldenburg Burnout Inventory. Common mental health problems defined as DASS-21≥34 and burnout as OLBI ≥ 35. Data are presented as *n* (%) of participants meeting the respective cut-off criteria.

Table IV: Distribution of severity of depression, anxiety and stress, and overall prevalence of common mental health problems and burnout among healthcare workers (N=704).

Severity	Depression n (%)	Anxiety n (%)	Stress n (%)
Normal	435 (61.8)	415 (58.9)	516 (73.3)
Mild	83 (11.8)	53 (7.5)	61 (8.7)
Moderate	94 (13.4)	119 (16.9)	61 (8.7)
Severe	52 (7.4)	42 (6.0)	48 (6.8)
Extremely Severe	40 (5.7)	75 (10.7)	18 (2.6)

DASS-21 = Depression Anxiety Stress Scale 21-item version; OLBI = Oldenburg Burnout Inventory. Severity cut-offs: depression (0–9 normal, 10–13 mild, 14–20 moderate, 21–27 severe, ≥28 extremely severe), anxiety (0–7, 8–9, 10–14, 15–19, ≥20), stress (0–14, 15–18, 19–25, 26–33, ≥34). Data are presented as *n* (%).

Factors Associated with Depression, Anxiety, Stress, and Burnout

Sociodemographic Factors*:* Higher rates of common mental health problems were observed among those aged 20 to 29 years, unmarried individuals, those with children under 5 to 18 years, and those with family members in Brunei. In contrast, lower rates were seen among those aged 50 and above, and expatriate staff. Gender was not significantly associated with common mental health problems (p=0.053). Burnout was more prevalent among younger, unmarried participants, Bruneian nationals, and those with family members in Brunei. Lower burnout rates were seen among those aged 50 and above, and expatriate staff (**Table I**).

Profession was not significantly associated with common mental health problems (p=0.112) but was strongly associated with burnout (p<0.001). Burnout was highest among dentists (95.8%), followed by allied health professionals (81.4%), nurses (74.0%), and doctors (54.1%). Within medical and nursing professions, burnout rates were highest at both ends of the seniority spectrum – among foundation year doctors and consult-

ants, and among assistant nurses and senior nursing officers. Several workplace factors were associated with higher rates of both outcomes, including working in Brunei for 2 to 5 years, performing clinical duties beyond one's training scope, holding additional administrative responsibilities, experiencing pandemic-related workplace changes, and perceiving the workplace as inadequately prepared. Hospital-based roles and enrolment in training programmes were associated with higher rates of common mental health problems specifically, while shift work was more strongly associated with burnout (p=0.022). Direct involvement in COVID-19 patient care was significantly associated with common mental health problems (p<0.001) but not burnout (p=0.093) (**Table II**).

Mental Health History: Participants with a history of mental health problems, a formal psychiatric diagnosis, or difficulty accessing mental health support had significantly higher rates of both outcomes. Those who reported previous thoughts of self-harm or suicide, or previous attempts, also showed higher rates of both outcomes (**Table III**).

Multivariable Analysis: Binary logistic regression identified several independent predictors of both outcomes. Multicollinearity was assessed using Variance Inflation Factors and no variable exceeded a VIF of 10, confirming multicollinearity was not a significant concern.

For common mental health problems, older age was strongly protective. Compared to those aged 20 to 29 years, participants in the 30 to 39, 40 to 49, and 50 and above age groups had progressively lower odds (OR 0.26, 95% CI 0.12–0.57; OR 0.24, 95% CI 0.10–0.62; and OR 0.15, 95% CI 0.04–0.49 respectively; p=0.028 overall). Performing clinical duties outside one's training scope (OR 1.63; 95% CI 1.05–2.54; p=0.030) and direct involvement in COVID-19 patient management (OR 1.88; 95% CI 1.05–3.37; p=0.033) were independently associated with higher odds of common mental health problems.

For burnout, expatriate staff had significantly lower odds than Bruneian nationals (OR 0.25; 95% CI 0.13–0.47; p<0.001). Shift work (OR 1.69; 95% CI 1.06–2.68; p=0.027) and performing administrative duties (OR 1.68; 95% CI 1.06–2.64; p=0.027) were also independent predictors of burnout.

Several factors predicted both outcomes. Mental health problems within the past week were among the strongest predictors of common mental health problems (OR 6.84; 95% CI 4.39–10.67; p<0.001) and burnout (OR 2.64; 95% CI 1.41–4.98; p=0.003). Mental health problems within the past year similarly predicted both outcomes (OR 3.33; 95% CI 1.95–5.69; p<0.001 and OR 4.55; 95% CI 2.87–7.20; p<0.001 respectively). Difficulty accessing mental health support was significantly associated with both outcomes, with those reporting extreme difficulty showing the highest odds of common mental health problems (OR 5.04; 95% CI 1.43–17.72; p=0.012), while for burnout a significant gradient was observed from neither easy nor difficult through to extremely difficult access (**Table V**).

In free text responses, participants identified pre-existing workplace stressors including difficulties with management, interpersonal conflict with colleagues, and high workload, as contributing factors to poor mental health and burnout (see **Appendix 1**—*refer to page 134*).

DISCUSSION

This study provides important insights into the mental health burden experienced by government healthcare workers in Brunei Darussalam during the second and subsequent waves of COVID-19. The finding that nearly a third of participants met the threshold for common mental health problems showed an increase from the 21.5% reported during the first wave,[5] suggesting that the cumulative demands of a prolonged pandemic took a greater psychological toll over time, even as healthcare workers became more experienced in managing COVID-19. The decrease in burnout from 85.3% to 71.7% may appear counterintuitive alongside rising mental health problems, but may reflect a degree of adaptation. Healthcare workers who remained in the workforce through successive waves may have developed greater familiarity with the pandemic demands and improved professional self-efficacy, even while their overall psychological wellbeing continued to deteriorate.[17]

Younger healthcare workers, particularly those aged 20 to 29 years, were consistently the most vulnerable group for both outcomes. This is consistent with broader literature showing that early career professionals lack the accumulated coping strategies, professional identity, and social resources that tend to buffer against psychological distress during crises.[27] The finding that unmarried participants fared worse for common mental health problems aligns with evidence that spousal support plays a meaningful protective role during periods of sustained occupational stress.[20,21] Having family members in Brunei was associated with higher rates of both outcomes, which may seem paradoxical but likely

reflects the dual burden of caring responsibilities at home alongside fear of transmitting infection to loved ones - a tension that has been documented among front-line workers in other pandemic contexts.[19] Conversely, having school-aged children between 5 and 18 years was associated with lower rates of common mental health problems, possibly because children of this age are more independent and less demanding of direct caregiving. Female participants had significantly higher burnout rates, which may reflect the compounding effect of professional demands alongside disproportionate domestic and caregiving responsibilities within Brunei's cultural context,[18] though gender was not independently associated with common mental health problems after accounting for other factors.

Expatriate staff showed significantly lower burnout rates than Bruneian nationals, a finding that warrants careful interpretation. While this may reflect genuine differences in resilience or coping style, it is also plausible that expatriate workers underreported difficulties due to concerns about job security and visa status. This is a pattern observed in other healthcare workforce studies.[5] Alternatively, expatriate staff may not have been as affected by some of the cultural and social pressures that Bruneian nationals faced, including community expectations and family obligations during the pandemic.[22]

The professional and workplace findings suggest particular vulnerability of those whose roles were most disrupted by the pandemic. Dentists had the highest burnout rate of any professional group, which is consistent with their widespread redeployment to high-risk swabbing and testing centres. Such roles were both outside their usual scope and carried heightened infection risk. Within medicine and nursing, burnout was highest at the extremes of seniority. Among doctors, foundation year doctors and consultants were most affected, likely reflecting the pressures of inexperience on one end and ultimate clinical responsibility on the other.[23,24] Among nurses, assistant nurses and senior nursing officers showed the highest burnout, possibly for similar reasons. The former group facing high

Table V: Factors associated with common mental health problems and burnout among healthcare workers — binary logistic regression (N=704).

	Common Mental Health Problems (DASS-21 ≥34)				Burnout (OLBI ≥35)			
Variable	**OR**	**95% CI Lower**	**95% CI Upper**	***p*-value**	**OR**	**95% CI Lower**	**95% CI Upper**	***p*-value**
Age group (ref: 20–29 years)								
30–39 years	**0.260**	0.119	0.568	**0.001**	0.676	0.297	1.539	0.350
40–49 years	**0.242**	0.095	0.617	**0.003**	0.458	0.179	1.176	0.105
50 years and above	**0.147**	0.044	0.489	**0.002**	0.383	0.133	1.104	0.076
Nationality (ref: Bruneian national)								
Expatriate staff	0.704	0.324	1.531	0.376	**0.246**	0.129	0.468	**<0.001**
Duration working in Brunei (ref: under 2 years)								
2–5 years	1.860	0.886	3.904	0.101	0.984	0.423	2.287	0.970
6–10 years	2.000	0.797	5.021	0.140	1.220	0.511	2.913	0.655
More than 10 years	1.630	0.603	4.409	0.336	0.868	0.347	2.170	0.762
Working pattern (ref: office hours)								
Shift work	0.906	0.579	1.417	0.666	**1.686**	1.060	2.682	**0.027**
Clinical duties outside training scope (ref: No)								
Yes	**1.632**	1.048	2.542	**0.030**	1.540	0.990	2.395	0.055
Administrative duties (ref: No)								
Yes	0.746	0.466	1.194	0.222	**1.676**	1.062	2.644	**0.027**
Direct management of COVID-19 patients (ref: No)								
Yes	**1.881**	1.051	3.367	**0.033**	0.935	0.548	1.594	0.804
Mental health problems in past week (ref: No)								
Yes	**6.841**	4.385	10.670	**<0.001**	**2.644**	1.405	4.976	**0.003**
Mental health problems in past year (ref: No)								
Yes	**3.332**	1.952	5.688	**<0.001**	**4.546**	2.870	7.201	**<0.001**
Access to mental health support (ref: extremely easy)								
Moderately easy	1.099	0.289	4.182	0.890	2.154	0.867	5.352	0.098
Neither easy nor difficult	2.010	0.605	6.678	0.255	**2.785**	1.215	6.387	**0.016**
Moderately difficult	2.537	0.718	8.961	0.148	**3.340**	1.284	8.690	**0.013**
Extremely difficult	**5.038**	1.432	17.718	**0.012**	**3.094**	1.169	8.184	**0.023**

Bold values indicate statistical significance at p<0.05. OR = odds ratio; CI = confidence interval. Reference categories shown in parentheses. Hosmer-Lemeshow goodness-of-fit: DASS-21 model *p*=0.360; OLBI model *p*=0.748. Multicollinearity assessed using Variance Inflation Factors; no VIF exceeded 10.

physical and emotional workload with limited autonomy, and the latter carrying supervisory and administrative burdens on top of clinical responsibilities. Those with 2 to 5 years of experience in Brunei showed the highest rates of both outcomes across all duration groups, which may reflect a period of career transition where the initial adjustment has passed but experience and seniority have not yet accumulated sufficiently to buffer against pandemic pressures.

The study also showed independent association between performing clinical duties outside one's training scope and higher odds of common mental health problems. Being asked to perform unfamiliar clinical tasks in an already high pressure environment represents a compound stressor - combining skill uncertainty with heightened clinical risk - and our findings suggest this had a measurable psychological impact independent of other workplace factors.[28] Similarly, direct COVID-19 patient management independently predicted common mental health problems, consistent with the broader literature showing that frontline exposure to severely ill patients carries significant psychological costs.[25] For burnout specifically, shift work and administrative duties emerged as independent predictors, reflecting the well-established relationship between irregular working patterns, expanded non-clinical responsibilities, and occupational exhaustion.[25,26]

Perhaps the most clinically important finding is the strong and independent association between a history of mental health difficulties and both outcomes. Participants who reported mental health problems within the past week had nearly seven times the odds of meeting the threshold for common mental health problems and nearly three times the odds of burnout, even after adjusting for all other variables. This underscores a well-recognised but often inadequately addressed reality that those who have previously struggled with their mental health are the most at risk during periods of sustained occupational stress, and are therefore the group most in need of proactive outreach and support.[5,25] The finding that difficulty accessing mental health support independently predicted both outcomes, with increasing odds at each level of difficulty, reinforces this point. It is not sufficient to have mental health services available in principle. They must be genuinely accessible, confidential, and trusted by the workforce if they are to have any protective effect. Participants' own free text responses identified lack of confidentiality, stigma, and top-down management culture as key barriers, pointing to systemic issues that cannot be addressed by clinical services alone.

While this study was conducted in the context of COVID-19, its findings have broader relevance. Any major disruptive event, whether a future infectious disease outbreak, a natural disaster, or a mass casualty incident, is likely to generate similar patterns of occupational stress, role expansion, and workforce strain. The vulnerability factors identified here, particularly younger age, limited experience, expanded clinical roles, and pre-existing mental health difficulties, are likely to operate in any such context. Healthcare organisations that use these findings to develop standing frameworks for workforce mental health support, rather than improvising a response each time a crisis hits, will be better placed to protect their staff and maintain a functioning system when it matters most.

In our study, there are several limitations that should be considered when interpreting our findings. The study included only government sector healthcare workers, which may limit generalisability to the broader workforce. Reliance on self-reported tools introduces the possibility of response bias, and the use of an online survey may have excluded those with limited internet access. Recall bias is an inherent limitation given the retrospective nature of some questions, and the cross-sectional design precludes causal inference. The survey was conducted at a single time point, which may not capture how mental health changed across the course of the pandemic. The large number of variables examined in the bivariate analysis raises the possibility of type I error due to multiple comparisons, which should be considered when interpreting the chi-square findings. Additionally, four participants did not disclose their gender and two did not respond to the question on children below five years of age; these represent less than 1% of the sample and are unlikely to have materially affected the findings. Future research using longitudinal designs and broader sampling would strengthen the evidence base.

CONCLUSION

This study identified a substantial burden of depression, anxiety, stress, and burnout among healthcare workers in Brunei Darussalam during the second and subsequent waves of the COVID-19. While burnout rates were lower than during the first wave, common mental health problems increased, suggesting that prolonged pandemic exposure affected psychological wellbeing and burnout differently over time.

Younger workers, those performing roles outside their usual scope, and those with a history of mental health difficulties were consistently the most

vulnerable. The strongest predictor of poor outcomes across both measures was a prior history of mental health problems, highlighting the value of early identification and proactive support for at-risk staff. Difficulty accessing mental health support independently worsened outcomes, reflecting a systemic gap that targeted interventions alone cannot address.

Addressing these challenges requires a coordinated approach that includes targeted support for high-risk groups, improvements to workplace culture and preparedness, and better access to confidential mental health services. Strengthening these systems is important not only for the wellbeing of individual workers, but for the resilience and sustainability of the healthcare workforce as a whole. The findings from this study extend beyond COVID-19 and can inform how health systems prepare for and respond to future crises.

Abbreviations

SARS-CoV2	Severe acute respiratory syndrome coronavirus 2
WHO	World Health Organisation
AHPCBD	Allied Health Professions Council of Brunei Darussalam
DASS-21	Depression, Anxiety and Stress Scale 21-item Version
OLBI	Oldenburg Burnout Inventory

Ethical Considerations

Ethical approval was granted by the Medical and Health Research Ethics Committee (MHREC) of the Ministry of Health, Brunei Darussalam (reference: MHREC/MOH/2022/10(3)).

Declarations

All the authors declared no competing interests.

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Appendix I: Participants' views of the causes of poor workplace mental health and suggestions for improvement.

	Causes of poor workplace mental health	Suggestions for improving workplace mental health
1.	Chronic understaffing leading to excessive workload, inability to take leave, and poor staff to patient ratios	Adequate staffing levels, fair distribution of workload, and protected rest periods including restoration of frozen annual leave
2.	Fear of COVID-19 infection and risk of transmitting infection to family members	Adequate provision of personal protective equipment, clear infection control protocols, and psychological support for frontline workers
3.	Lack of 24-hours access to mental health support services specifically dedicated to healthcare workers	Establishment of a mental health centre or 24-hour mental health helpline for healthcare workers
4.	Lack of confidentiality when seeking mental health support	Disengagement of mental health services from the government healthcare system through collaboration with and accessibility to non-government options such as private psychology or counselling practices
5.	General stigma surrounding mental health	Increasing awareness of mental health through regular screening and promotional campaigns
6.	Poor staff welfare, including both physical and mental health welfare	Provision of recreational facilities at the workplace, introduction of mental health workplace policies such as a compulsory mental health day off, and inclusion of mental health days within self-certified sick leave entitlement
7.	Unsupportive and biased working environment	Incorporating team-building retreats or recreational activities within departments to build harmonious working relationships among staff
8.	Lack of recognition for those working at ground level	Instilling a culture of appreciation through yearly recognition events, incentives such as meal vouchers, and visible recognition mechanisms at the workplace such as staff commendation boards displaying positive patient and colleague feedback at hospitals, health centres, and clinics
9.	Top-down management culture limiting staff voice	Improving leadership styles and providing opportunities for ground-level staff to contribute their views, for example through regular townhalls