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Stress and burnout amongst foundation year doctors during COVID- 19 pandemic lockdown

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Keywords: Foundation year doctors; Covid-19 pandemic; Lockdown; Stress; Burnout.

Abbreviations: FYD: Foundation Year Doctor; UK: United Kingdom; NHS: National Health Service; MBI: Maslach Burnout Inventory scale; EE: Emotional Exhaustion; PA: Personal Accomplishment; DP: Depersonalisation.

Abstract

Context: Foundation Year Doctors (FYD) have been immensely impacted by the COVID-19 pandemic because of its effect on their academic training, uncertainties about the novel coronavirus, specific pandemic issues around patients and personal safety.

Aims: This study examined the effect of the COVID-19 pandemic first national lockdown in the United Kingdom on FYD stress and burnout levels.

Method: Quantitative study was conducted to compare Foundation Year doctors (FYD) level of stress and burnout pre and during the first national lockdown of the COVID 19 pandemic in the UK using the Maslach Burnout Inventory (MBI) scale. Descriptive analysis was used to present background information of participants and the effect of COVID-19 on participants. Furthermore, Wilcoxon-signed ranked test was used to identify any significant increase in stress and burnout levels during COVID-19 pandemic. Bivariate Pearson Chi-square test was used to assess any association between categorical variables and burnout levels. Multinomial regression was conducted to identify the predictor of high stress andburnout levels. A p-value of <0.05 was considered of statistical significance.

Results: 52 FYD took part in this study. Wilcoxon-signed ranked test showed that in comparison with pre-COVID-19 pandemic, there was a significant increase in stress and burnout levels during COVID-19 pandemic (Emotional Exhaustion, p=.016; Personal Accomplishment, p=.010, Depersonalisation p=.006). Bivariate Pearson chi-square identified several factors associated with high stress and burnout levels during the national lockdown. Multinomial regression revealed having previous mental health problems (p=.010), speciality not offering internal support (p=.027), not having regular access to supervisor (p=.001) and a feeling that regular supervision was not adequate to help well-being (p=.044) as the predictors of high stress level during the national lockdown.

Conclusion: This study provides empirical insight into the level of stress and burnout experienced by FYD during the first national lockdown in UK. It also provides an awareness of specific COVID-19 factors associated with stress and burnout as well as the predictors of

high stress and burnout levels amongst FYD during the COVID-19 pandemicnational lockdown.

Implication: FYDs wellbeing should be prioritised, especially as COVID-19 remains a global health problem. An understanding of stress and burnout levels and COVID-19 specific factors responsible for the high stress and burnout may be useful for researchers, professional and regulatory bodies of the medical training in developing evidence-based policies and strategies.

Introduction

Globally, healthcare professionals continue to face a high level of stress and burnout as they provide care during this COVID-19 pandemic [1-3]. The ambiguity surrounding the novel coronavirus pneumonia further makes healthcare professionals experience increase stress and burnout [1,3]. Since the first confirmed case of COVID-19 in the United Kingdom (UK) on the 29th of January 2020, uncertainties soar amongst healthcare professionals' about how best to address issues around patient safety and their personal safety.

Imo [4] study indicates that 17 to 52% of UK doctors experience stress related psychiatric disorders and/or burnout in their everyday practice and are more prone to burnout than their European counterparts. Factors such as: number of hours worked, job stress and overload were noted to account for high stress related psychiatric disorders and/or burnout amongst doctors [4-6]. The rapid spread of the COVID-19 virus means that doctors are having to cope with not just the everyday care of looking after patients but also specific COVID-19 concerns such as: shortage of Personal Protective Equipment (PPE), testing for health care workers and unequal fatal impact on Black And Minority Ethnic (BAME) community [7].

In the UK, Foundation Year Doctors (FYD) are medical graduates commencing two years post qualification training to ensure they develop both clinical and non-clinical skills to safely deliver care to patients [8,9]. They are often called 'junior doctor'. These doctors have been noted to be one of healthcare professional with high levels of stress or burnout. A General Medical Council survey revealed that a quarter of junior doctors' experience burnout and higher rates of depression [10]. Similar findings have been noted in many countries with an Australian study indicating that 18-82% of junior doctors experience burnout and it increases as their training progresses [6].

As the number of confirmed COVID 19 cases and death continues to increase, all doctors especially FYD were exposed to physical and psychological stress of managing acutely ill patients [1-3]. Hence, it is imperative to investigate the level of stress and burnout experienced by foundation year doctors during the first national lockdown of the COVID-19 pandemic. This may be helpful in developing evidence-based strategy that improves the wellbeing of foundation year doctors during public health outbreaks or other forms of health emergencies.

Therefore, the aim of this study is to examine the effect of the COVID-19 pandemic on foundation year doctors' stress and burnout levels. The objectives are to estimate the prevalence of stress and burnout amongst foundation year doctors during COVID-19 pandemic, identify COVID-19 specific factors associated with stress and burnout amongst FYD, identify interventions used by foundation year doctors to address stress and burnout experienced during the COVID-19 pandemic and formulate recommendations effective in reducing stress and burnout amongst foundation year doctors.

Methods

Quantitative study was conducted to investigate Foundation Year Doctors (FYD) level of stress and burnout pre- and during the first national lockdown of the COVID 19 pandemic in the UK which took place between the 23rd of March 2020 and 28th of May 2020. This study was conducted across three sites of a teaching National Health Service (NHS) Trust hospital in the West Midlands region of the UK. Only FYDs employed by the Hospital Trust at the time of the first national COVID-19 pandemic lockdown were included in this study. A convenience sample of FYD working across all three hospital sites were invited to participate. There are 183 FYD across the three hospital sites and invitation was sent via postgraduate training programme and the Trust FYD social media platform. Data collection took place over two weeks duration with weekly reminders. All participants were asked to reflect and self-report their level of stress and burnout pre and during COVID.

Online questionnaire of about 20 minutes duration comprising closed ended questions was developed based on personal experience, emerging evidence from previous literature and discussion amongst foundation year doctor. Questionnaire was split into 4 sections. The first section gathered background information about FYDs; the second section aimed to provide details about the potential influence of COVID 19 lockdown and the foundation training; the third section investigated the views about the amount of support available during the COVID 19 pandemic lockdown and the fourth section examined the level of stress and burnout of the FYD using the Maslach Burnout Inventory (MBI) scale.

The MBI scale is a 22-item validated tool that access stress and burnout using three domains, Emotional Exhaustion (EE), Personal Accomplishment (PA) and Depersonalisation (DP). EE is assessed using 9 items and measures the extent an individual is feeling emotionally drained by work. DP is measured using 5 items and describes the extent to which an individual is feeling detached and uninvolved. PA is measured using 8 items and assesses an individual perception of competence and accomplishments. All MBI scale items are score using a seven-point Likert scale (0 = 'Never', 6= 'Everyday'). The cut-off scores for each sub-scale based on normative data from a sample of health professionals in the United States [11]. The total score for each do-

main is categorised as 'low', 'moderate; and 'high'. High scores of EE and DP signify high degree of burnout while low PA signifies high levels of burnout.

Data analysis was conducted using SPSS version 26. Categorical variables are presented as numbers and percentages. Bivariate Pearson Chi-square test was used to assess any association between categorical variables and burnout levels. Wilcoxon Signed Ranked Test was used to assess level of burnout pre-and during COVID 19 pandemic. Also, multinomial logistic regression was used to identify predictors for high level of burnout amongst FYD. A p-value of < 0.05 was considered of statistical significance.

Ethical approval was obtained from Health Research Authority (HRA) and Health and Care Research Wales (HCRW) (IRAS project ID: 287664). In addition, access was obtained from the Trust Foundation training co-ordinator. All participants had access to participant information sheet and completed consent form before the online questionnaire was filled.

Table 1: Background information of participants.

Characteristics	Category	N (%)
Gender	Female	30 (57.7)
	Male	22 (42.3)
Ethnicity	Arab	1 (1.9)
	Asian	15 (28.8)
	Black	3 (5.8)
	Not specified	1 (1.9)
	White	32 (61.5)
Foundation year	Year 1	31 (59.6)
	Year 2	21 (40.4)
Defence Trainee	Yes	8 (15.4)
	No	37 (71,2)
	Prefer not to say	1 (1.9)
	Not applicable	6 (11.5)
Academic Trainee	Yes	5 (9.6)
	No	40 (76.9)
	Prefer not to say	1 (1.9)
	Not applicable	6 (11.5)
Speciality	Acute Medical Unit (AMU)	8 (15.4)
	Emergency Department (ED)	2 (3.8)
	Intensive Therapy Unit (ITU)	11 (21.2)
	Medicine	18 (34.6)
	Psychiatry	2 (3.8)
	Surgery	11 (21.2)
Previous Mental problems	Yes	12 (23.1)
	No	37 (71.2)
	Prefer not to say	3 (5.8)
Physical illness	Yes	10 (19.2)
	No	40 (76.9)
	Prefer not to say	2 (3.8)

Table 2: Impact of the COVID-19 pandemic on Foundation Year doctors training and support received during COVID-19 pandemic.

Characteristics	Category	N (%)
Training affected during COVID-19 pandemic	Yes	45 (86.5)
	No	7 (13.5)
If an academic or defence trainee, did COVID-19 affect your training	Yes	14 (26.9)
	No	4 (7.7)
	Not applicable	34 (65.4)
Treat COVID-19 patient	Yes	51 (98.1)
	No	1 (1.9)
Living status	Alone	10 (19.2)
	Parents	13 (25)
	Partners	11 (21.2)
	Friends	14 (26.9)
	Others	4 (7.7)
Have dependents in living accommodation	Yes	3 (5.8)
	No	49 (94.2)
Diagnosed with COVID-19	Yes, confirmed on testing	17 (32.7)
	Yes, I suspect because I had symptoms	12 (23.1)
	No	23 (44.2)
Members of household diagnosed with COVID-19	Yes, confirmed on testing	9 (17.3)
	Yes, I suspect they had because they had symptoms	7 (13.5)
	No	26 (50)
	I live alone	10 (19.2)
Change in weekly working hours	Increased	37 (71.2)
	Decreased	7 (13.5)
	Stayed the same	8 (15.4)
Want to move job	Yes	26 (50)
	No	25 (48.1)
	Prefer not to say	1 (1.9)
Redeployed	Yes	19 (36.5)
	No	33 (63.5)
Placed on emergency rota	Yes	50 (96.2)
	No	2 (3.8)
Where to go if any difficulties arise	Yes	40 (76.9)
	No	12 (23.1)
Specialty offered internal support	Yes	22 (42.3)
	No	30 (57.7)
Access wellbeing support	Yes	21 (40.4)
	No	31 (59.6)
If wellbeing support accessed helpful	Yes	20 (38.5)
	No	4 (7.7)
	Not applicable	28 (53.8)
Have access to supervisor regularly	Yes	21 (40.4)
	No	30 (57.7)
	Prefer not to say	1 (1.9)
Find the supervision adequate to help with wellbeing	Yes	19 (36.5)
	No	16 (30.8)
	Not applicable	17 (32.7)

Table 3: Mean scores, levels of MBI subscales and Wilcoxon Signed Ranked Test (p< .005).

Characteristics	Pre-COVID [N/ %]	During COVID [N/ %]	Wilcoxon signed Ranked Test
Emotional Exhaustion (EE)			
Low (0-18)	26 (50)	14 (26.9)	
Moderate (19-26)	11 (21.2)	18 (34.6)	
High (27-54)	15 (28.8)	20 (38.5)	Z= -2.403, p= .016
Mean score	19.08	24.60	
Personal Accomplishment (PA)			
Low (40-48)	18 (34.6)	10 (19.2)	
Moderate (34-39)	14 (26.9)	17 (32.7)	
High (0-33)	20 (38.5)	25 (48.1)	Z= -2.586, p=.010
Mean score	34.35	32.35	
Depersonalisation (DP)			
Low (0-5)	20 (38.5)	13 (25)	
Moderate (6-10)	14 (26.9)	12 (23.1)	
High (11-30)	18 (34.6)	27 (51.9)	Z= -2.727, p= .006
Mean score	7.81	9.90	

Results

A total of 52 FYD took part in this study with an age range of 24-31 years old and a mean of 26.69. Table 1 presents background information of FYD who took part in this study. There were more females (57.7%), individual from white ethnicity (61.5%), first year FYD (59.6%) and those on medicine rotation (34.6%). More than two-thirds of the FYD are not Defence or academic trainee, however, there are slightly more defence (15.4%) than academic trainee (5%). More than two-thirds (71.2%) have no previous mental illnesses, and more than three-quarters (76.9%) have no physical illness.

Table 2 presents information about the impact of the COVID-19 pandemic on foundation year doctors training and the support received during COVID-19 pandemic. Over three-quarters (86.5%) felt that COVID-19 affected their training. Also, more academic or defence trainees (26.9%) felt that the COVID-19 affected their training. Nearly all (98.1%) FYD treated COVID-19 patients. More FYD lived with friends (26.9%) or with parents (25%) and majority (94.2%) did not have dependents living with them. More than two-thirds (71.2%) indicated their weekly working hours increased, because nearly all (96.2%) were placed on emergency rota. However, half of the FYD (50%) did not want to move job and nearly two-thirds (63.5%) were not redeployed to another department.

More than three-quarters of FYD knew where to go if any difficulties arise and more than half of the FYD indicated that their speciality did not offer internal support (57.7%). Less than half of the FYD accessed wellbeing support (40.4%) and majority of those who accessed the well being found it helpful (38.5% of 40.4%). Similarly, less than half of the FYD had access to regular supervision (40.4%) and majority of those who had access to regular supervision (36.5% of 40.4%).

Pre-COVID-19 pandemic, FYD doctors had moderate levels of EE, DP and high levels of PA. Although, EE and DP remained at moderate level during COVID, the rate did increase significantly, whereas PA changed from being high pre-COVID-19 to moderate during COVID-19. This indicates FYD experienced significantly increased level of stress and burnout during COVID-19 pandemic. See Table 3.

We only reported Bivariate Chi-square test of statistically significant features to EE, PA and DP during COVID (see Table 4). There was a significant association between EE and gender (p= .004), physical illness (p= .044) and COVID 19 affecting academic or defence trainee (p= .041). Bivariate Pearson Chi-square revealed that more females reported high EE. Also, more FYD with physical illness had high EE, whereas more of the FYD with no physical illness had moderate EE.

There was a significant association between PA and the speciality FYDs were working during the pandemic (p= .007), changes in weekly working hours (p= .000), access to regular supervision during the pandemic (p= .022) and if the supervision was adequate to help with wellbeing (p= .003). Nearly all doctors working in AMU speciality had high PA and more doctors working in Medicine speciality reported moderate than high or low PA. Those FYD whose working hours were increased tend to indicate high PA. More FYD who did not access regular supervision reported moderate or high PA than those who had regular access.

Furthermore, there was a statistical association between DP and having a previous mental illness (p= .021), training affected by COVID-19 (p= .002) and wanting to move job during the pandemic (p= .006). Most of the FYD who felt their training was affected by COVID-19 had high DP. Likewise, those who wanted to move jobs also reported a high DP.

There was a statistically significant association between EE and DP with speciality offering internal support and where to go if the FYD had any difficulty. FYD whose speciality did not offer internal support reported either moderate or high EE and DP. Also, FYD, who knew where to go if any difficulties arise, had more moderate or high EE and DP.

Table 5 presents significant predictors of high stress and burnout as per multinomial logistic regression. Having previous mental health problems (p= .010), speciality not offering internal support (p= .027), not having regular access to supervision (p= .001) and also feeling that the regular supervision was not adequate to help wellbeing (p=.044) are all significant predictors of high EE. Furthermore, having previous mental health problems (p= .000) is a significant predictor of high PA and speciality not offering internal support is a significant predictor of high DP.

Discussion

The finding of this study confirms that FYD were more stressed and experienced burnout during than pre-COVID-19 pandemic. This is consistent with studies globally signifying that all healthcare especially those working as frontline workers had high levels of anxiety, stress, and burnout during this pandemic period [12-15]. Moreover, Kannampallil [16] study in the United States (US) revealed that the prevalence of stress and burnout amongst trainee doctors during this pandemic was higher than other healthcare professionals. This could be due to the dual role of FYD as care giver and learners which further increase the level of stress and burnout.

High levels of stress and burnout was noted amongst females, specific specialities, and having previous mental illness. Hence, it is not surprising that these factors have also been reported in many COVID-19 related studies [12-16]. Generally, all of these factors have being noted to contribute to high levels of burnout amongst FYDs pre-COVID-19 pandemic [4-6]. Besides, our study reveals that FYD had moderate levels of EE and

Table 4: Crosstab and Chi-square analysis (p< .005).

Characteristics	Emotional Exhaustion			Personal Accomplishment			Depersonalisation		
Gender	**low**	**Moderate**	**High**						
Female	7 (50%)	6 (33.3%)	17 (85%)						
Male	7 (50%)	12 (66.7%)	3 (15%)						
	Chi-square (X^2 = 10.825, p=. 004)								
Physical illness	**low**	**Moderate**	**High**						
Yes	2 (14.3%)	1 (5.6%)	7 (19.2%)						
No	12 (85.7%)	17 (94.4%)	11 (76.9%)						
Prefer not to say	0	0	2 (3.8%)						
	Chi-square (X^2 = 9.824, p= .044)								
If an academic or defence trainee, did COVID-19 affect your training	**low**	**Moderate**	**High**						
Yes	7 (50%)	1 (5.6%)	6 (30%)						
No	0	3 (16.7%)	1 (5%)						
Not applicable	7 (50%)	14 (77.8%)	13 (65%)						
	Chi-square (X^2 =9.972, p= .041)								
Speciality				**low**	**Moderate**	**High**			
Acute Medical Unit (AMU)				0	1 (5.9%)	7 (28%)			
Emergency Department (ED)				0	2 (11.8%)	0			
Intensive Therapy Unit (ITU)				5 (50%)	0	6 (24%)			
Medicine				2 (20%)	10 (58.8%)	6 (24%)			
Psychiatry				0	0	2 (8%)			
Surgery				3 (30%)	4 (23.5%)	4 (16%)			
				Chi-square (X2 = 24.064, p= .007)					
Changes in weekly working hours				**low**	**Moderate**	**High**			
Increased				3 (30%)	13 (76.5%)	21 (84%)			
Decreased				1 (10%)	4 (23.5%)	2 (8%)			
Stayed the same				6 (60%)	0	2 (8%)			
				Chi-square (X2 = 21.391, p= .000)					
Access to supervisor regularly				**low**	**Moderate**	**High**			
Yes				8 (80%)	3 (17.6%)	10 (40%)			
No				2 (20%)	14 (82.4%)	14 (56%)			
Prefer not to say				0	0	1 (4%~)			
				Chi-square (X2 = 11.410, p= .022)					
Find the supervision adequate to help with wellbeing				**low**	**Moderate**	**High**			
Yes				8 (80%)	3 (17.6%)	8 (32%)			
No				1 (10%)	4 (23.5%)	11 (44%)			
Not applicable				1 (10%)	10 (58.8%)	6 (24%)			
				Chi-square (X2 = 15.789, p= .003)					
Previous mental illness							**low**	**Moderate**	**High**
Yes							2 (15.4%)	3 (25%)	7 (25.9%)
No							11 (84.6%)	6 (50%)	20 (74.1%)
Prefer not to say							0	3 (25%)	0
							Chi-square X2 = 11.566, p= .021		
Training affected by COVID-19							**low**	**Moderate**	**High**
Yes							11 (84.6%)	7 (58.3%)	27 (100%)
No							2 (15.4%)	5 (41.7%)	0
							Chi-square (X2 = 12.435, p=.002)		
Want to move job							**low**	**Moderate**	**High**
Yes							1 (7.7%)	7 (58.3%)	18 (66.7%)

No							12 (92.3%)	5 (41.7%)	8 (29.8%)
Prefer not to say							0	0	1 (3.7%)
							Chi-square (X2 = 14.550, p= .006)		
Speciality offer internal support	**low**	**Moderate**	**High**				**low**	**Moderate**	**High**
Yes	11 (78.6%)	7 (38.9%)	4 (20%)				12 (92.3%)	6 (50%)	4 (14.8%)
No	3 (21.4%)	11 (61.1%)	16 (80%)				1 (7.7%)	6 (50%)	23 (85.2%)
	Chi-square (X2 = 11.707, p=. 003)						Chi-square (X2 = 21.967, p= .000)		
Where to go if there was any difficulty	**low**	**Moderate**	**High**				**low**	**Moderate**	**High**
Yes	13 (92.9%)	17 (94.4%)	10 (50%)				13 (100%)	10 (83.3%)	17 (63%)
No	1 (7.1%)	1 (5.6%)	10 (50%)				0	2 (16.7%)	10 (37%)
	Chi-square (X2 = 13.282, p= .001)						Chi-square(X2 = 7.142, p= .028)		

Table 5: Multinomial logistic regression (p< .005), CI- Confidence Interval.

Characteristics	Emotional Exhaustion	Personal Accomplishment	Depersonalisation
Having previous mental health problems	B= -2.895, p= .010 95% CI = 0.006- 0.501	B= 13.771, p= .000 95% CI = 0.056- 7.850	
Speciality did not offer internal support	B= -3.884, p= .027 95% CI = 0.003-0.696		B= -3.402, p= .005 95% CI= 0.003-0.360
Not having regular access to supervisor	B= -5.804, p= .001 95% CI = 0.000- 0.082		
Did not feel that regular supervision was adequate to help wellbeing	B= 3.332, p= .044 95% CI= 1.088-7.699		

DP and high PA pre-COVID indicating that the foundation year training has characteristic features that affects the wellbeing of these particular doctors. This is consistent with previous studies that have indicated that 1 in 4 FYD experience burnout and higher rates of depression [10].

It is particularly important to identify unique COVID-19 related stress and burnout factors amongst FYDs. In fact, one of the recent editorial from the GMC acknowledged that COVID-19 have disrupted FYDs training [16]. Our findings shed insight into these unique factors, and they include: FY training affected by COVID-19, increased in weekly working hours, not having regular access to supervision, speciality not offering internal support, not knowing where to go if difficulties arise. This view is consistent with global studies about stress and burnout amongst healthcare professionals during COVID-19 [12-16] and those specific about trainee doctors [17].

In particular, four main factors were identified as predictors of high stress and burnout levels amongst FYD during the COVID-19 pandemic which implies that FYDs required more wellbeing support than ever during the pandemic. Current evidence indicates that the wellbeing support provided for UK healthcare workers during COVID-19 laid greater emphasis on individuals [18]. Nevertheless, these interventions need to be holistic taking into cognisance both the inherent stress and burnout factors peculiar to the foundation training and job-related factors. This view is consistent with a study by Walsh [19] conducted before the COVID-19 pandemic recommending that wellbeing interventions for junior doctors should take into cognisance job related factors such as inadequate support from managers or supervisors, being redeployed, inadequate staffing, difficult accessing statutory leave, and lack of time spent of self-care.

We acknowledge that Coronavirus was initially a novel virus, and the pandemic was unpredictable with no readymade wellbeing support intervention available. Nevertheless, COVID-19 continues to ravage globally. At the time of writing this study, the UK has had three national lockdowns and it is unclear if further peaks will occur. Therefore, much more than ever, wellbeing support needs to put in place for FYDs.

Foundation Year Doctors role as care givers and learners implies that their wellbeing should be given precedence. A recommendation for further research will be a longitudinal study to evaluate the changes in the level of stress and burnout of FYD as knowledge of tackling the virus continues to emerge. We will also suggest evaluation of wellbeing strategies and guidelines in place during the COVID-19 to identify how best to support FYD during the pandemic and should other forms of health emergencies occur in the future.

This research adds to body of knowledge of the impact of COVID-19 pandemic on healthcare workers by providing insight into the extent of stress and burnout faced by FYD. Furthermore, this study highlighted COVID-19 specific factors that impacted on the stress and burnout level. Besides, it also sheds lights on the predictors of high stress and burnout levels amongst FYDs.

The limitation of the study is the low response rate. Hence, firm generalisation cannot be made. Perhaps the reason for a low response rate was the short duration for data collection. This is because data collection coincided with the time FYD were ending their rotation and some leaving the Trust for career progression. Regardless, this study has helped understand the level of stress and burnout experienced by foundation year doctors during the COVID-19 pandemic lockdown. This may be helpful in developing evidence-based strategy that improves the wellbeing of foundation year doctors during public health outbreaks or other forms of health emergencies.

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