

# Stress and burnout syndrome in health-care providers treating dengue infection: A cross-sectional study

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## ABSTRACT

**Introduction:** Increased prevalence of dengue fever had led to increase stress in providing optimal care for patients. This has been identified as a potential factor that may lead to negative health effects on medical doctors. This study was designed to review the prevalence and associated factors of burnout syndrome (including depression, anxiety, and stress level) among clinicians in the setting of increasing cases of dengue in Malaysia.

**Methods:** A cross-sectional, multi-centre study was carried out among doctors in contact with patients with dengue infection from four major hospitals in Malaysia in 2015 using Maslach Burnout Inventory and DASS-21 questionnaire.

**Results:** A total of 313 respondents were included in this study with 15.9% of the respondents experiencing high burnout syndrome. Long working hours, depression, anxiety, and stress were significantly associated with high degree of burnout syndrome ( $p < 0.05$ ). However, number of dengue cases reviewed was not significantly associated with the degree of burnout syndrome. Depression and stress were among factors identified as the predictors for burnout syndrome.

**Conclusion:** High degree of burnout syndrome among clinicians with significant correlations with symptoms of depression and stress will require early identification to enable early measures to resolve, as well as prevent it. Future studies with more hospitals involvement should be conducted to establish the relationship between the degree of burnout syndrome and prevalence of dengue infection.

## KEY WORDS:

*Burnout syndrome, dengue, depression, anxiety, stress*

## INTRODUCTION

Dengue fever is a vector-borne disease caused by *Flaviviridae* virus and transmitted by *Aedes* mosquitoes. It is endemic in Malaysia with more than 100,000 cases of dengue infection reported each year.<sup>1</sup> This leads to an increased number of patients visiting the outpatient department, emergency department, and subsequently ward admissions. The influx

of patient admission, responsibility for critical decisions, potential serious consequences, and pressure to avoid medical errors were among several factors faced by medical doctors that renders medical practice inherently stressful.<sup>2</sup>

The stress to provide optimal care for patients has been identified as a potential factor that may lead to negative health effects on medical doctors.<sup>3</sup> Burnout usually develops after a prolonged response to chronic emotional and interpersonal job stressors, and is characterised by three dimensions, which comprise of emotional exhaustion, depersonalisation, and lack of personal accomplishment.<sup>4</sup> It is well documented that physicians experience a high level of stress and they are susceptible to burnout syndrome.<sup>5</sup> Studies had found that the mental well-being of a clinician was associated with work satisfaction, socio-economic prestige, and professional relations.<sup>6</sup>

The aim of this study was to review the prevalence and associated factors of burnout syndrome (including depression, anxiety, and stress level) among clinicians in the setting of increasing prevalence of dengue cases. This is the fundamental study to enable appropriate measures to be carried out to reduce the effect of burnout syndrome among our doctors.

## MATERIALS AND METHODS

### Study setting and population

This is a cross-sectional, multi-centre study among doctors (including house officers, medical officers, and specialists) from four hospitals, located in urban and suburban area in Malaysia. All registered medical practitioners from three main disciplines in contact with patients diagnosed with dengue infection, namely internal medicine, paediatric, and emergency department, were included in the study. Doctors who were not in charge of patients with dengue infection were excluded from the study. They were approached via universal sampling methods. The minimum sample size with a confidence interval of >90% was calculated to be 330 subjects, allowing 30% non-response rate. This study was registered with the National Medical Research Register, Malaysia and approved by Medical Research and Ethics Committee (MREC).

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### Data collection

Data were collected using a questionnaire that consisted of three parts. To ensure respondents validity, whereby only medical doctors participated in the study, license numbers of the doctors were included in the consent forms and checked via the Malaysian Medical Council (MMC) registry database.

The first part of the questionnaire included questions regarding socio-demographic characteristics and working conditions of the respondents. The second part of the questionnaire was the Maslach Burnout Inventory – Human Services Survey (MBI-HSS). This is a 22-item questionnaire, which includes questions to indicate frequency of which the respondents experience certain feelings in relation to their work. Three main domains; emotional exhaustion (EE), depersonalisation (DP), and personal accomplishment (PA), are evaluated in this inventory. EE consists of nine items to evaluate the feelings of being emotionally exhausted by work. DP consists of five items to measure an unfeeling and impersonal response towards recipients of the service, care, treatment, or instruction. PA consists of eight items to assess feelings of competence and successful achievement in one's work with people.<sup>2</sup> These items were answered in terms of the frequency with which the respondents experienced the feelings, on a 7-point scale ranging from 0 (never) to 6 (everyday). A higher score indicated greater burnout except for personal accomplishment scale, which was rated inversely. A high degree of burnout was represented by high scores of emotional exhaustion and depersonalisation with low scores of personal accomplishment.<sup>2</sup> The third part of the questionnaire was Depression, Anxiety, and Stress scale (DASS-21), which consisted of 21 self-reported items, designed to measure the severity of a range of symptoms common to both depression and anxiety. Each respondent was required to indicate the presence of a symptom over the previous week and was scored from 0 (did not apply at all over the last week) to 3 (applied very much or most of the time over the past week). The scoring would be multiplied by two and comparisons to be made between the three scales and percentile ranking severity labels obtained.

### Statistical Analysis

The software Statistical Package for Social Science (SPSS) version 21 (SPSS Inc., Chicago, IL, USA) was used to analyse all the data collected and extracted in this study. Categorical data was expressed as frequencies and percentages while continuous data was expressed as mean  $\pm$  standard deviation. The three subscale scores of the MBI-HSS were specified as three separate criterion variables. Raw scores of the three subscales were summed separately and then transformed into low, moderate or high. 'High degree of burnout' was defined as high emotional exhaustion and depersonalisation and low personal accomplishment. Descriptive statistics of the high degree of burnout across the socio-demographic and work characteristics was analysed. Differences in the prevalence of 'high degree of burnout' were tested with the Chi-square test for binomial variables. Multivariate logistic regression analysis was performed to obtain important predictors of high burnout. A logistic regression coefficient was used to estimate the odds ratios for each of the independent variables in the model. A p-value <0.05 was used as the level of significance.

**Table I: Socio-demographic of the participants**

Socio-demographic characteristic	Mean $\pm$ SD
Age; years	28.5 $\pm$ 3.7
Working hour/week; hours	66 $\pm$ 17
Income; Ringgit Malaysia	4991 $\pm$ 1187
	Number of participants, n (%)
Gender	
Male	120 (38.3)
Female	193 (61.7)
Logistic	
Urban	180 (57.5)
Suburban	133 (42.5)
Qualification	
House officer	120 (38.2)
Medical officer	167 (53.4)
Specialist	26 (8.4)
Working department	
Medicine	216 (69.0)
Paediatrics	44 (14.1)
Emergency	53 (16.9)
Marital Status	
Single	185 (59.1)
Married	127 (40.6)
Missing data	1 (0.3)
House owning status	
House owner	99 (31.6)
Not a house owner	208 (66.5)
Missing data	6 (1.9)
Employment	
Government	299 (95.5)
Government plus locum	14 (4.5)
Number of dengue cases seen per week	
<1	25 (8.0)
1 to 5	133 (42.5)
6 to 10	57 (18.2)
>10	96 (30.7)
Missing data	2 (0.6)

## RESULTS

### Socio-demographic and working characteristics

The socio-demographic and working characteristics of the study group are illustrated in Table I. The mean age of participants in our study was 28.5 $\pm$ 3.7 years. The mean working hours was 66 $\pm$ 17 hours and mean income was RM4991 $\pm$ 1187. Of the 313 respondents, 193 (61.7%) were females, 180 (57.5%) were working in an urban hospital, 167 (53.4%) were medical officers, 216 (68.8%) were working in internal medicine department, and 185 (59.1%) were single. Majority of the respondents (66.5%) did not own a house and only 4.5% of the respondents did private practice or locum in addition to their usual working hours. 92% of the respondents encountered at least 1 dengue case every week. Majority of them (42.5%) reviewed 1 to 5 dengue cases in a week, followed by 30.7% of them reviewed more than 10 dengue cases every week.

### Degree and prevalence of burnout subscale

The burnout subscales included emotional exhaustion, depersonalisation, and personal accomplishment. Mean scores were obtained for each of the three subscales and illustrated in Table II. They were categorised into low, moderate, and high by summing their raw scores and transforming the summation into categorisations (Table III).

**Table II: Average scores of subscales of the Maslach Burnout Inventory Human Service Survey (MBI-HSS) (N=313)**

Burnout subscales	Mean + SD	95% confidence interval
Emotional exhaustion	23.99 + 11.67	22.69 – 25.29
Depersonalization	10.17 + 6.15	9.49 – 10.85
Personal accomplishment	29.04 + 8.48	28.09 – 29.98

**Table III: Prevalence of Burnout Syndrome**

Maslach Burnout Inventory – Human Services Survey (MBI-HSS) subscale	Frequency (N)	Percent (%)
Overall Prevalence of High Burnout Syndrome	50	15.9
Emotional exhaustion	High	41.5
	Moderate	28.8
	Low	29.7
Depersonalization	High	35.5
	Moderate	32.6
	Low	31.9
Personal accomplishment	High	14.7
	Moderate	24
	Low	61.3

**Table IV: Degree of burnout by socio-demographic and work characteristics**

Socio-demographic and work characteristic	High burnout		P-value
	No	Yes	
	Mean ± SD		
Age	28.7±3.8	27.6±3.0	0.051
Working hour/ Week	64.8±15.8	72.5±23.1	0.045
Income	5048±1209	4695±1031	0.06
DASS -depression	7.7±7.3	16.8±8.4	<0.001
DASS -anxiety	8.9±7.5	14.8±8.7	<0.001
DASS-stress	10.7±6.9	17.6±8.1	<0.001
	Frequency (N, %)		
Gender			0.32
Male	104 (86.7)	16 (13.3)	
Female <sup>a</sup>	159 (82.4)	34 (17.6)	
Logistic			0.94
Urban	151 (83.9)	29 (16.1)	
Suburban <sup>a</sup>	112 (84.2)	21 (15.8)	
Qualification			0.18
House Officer	95 (79.2)	25 (20.8)	
Medical Officer	145 (86.8)	22 (13.2)	
Specialist <sup>a</sup>	23 (88.5)	3 (11.5)	
Department			0.71
Medicine	179 (82.9)	37 (17.1)	
Paediatrics	38 (86.4)	6 (13.6)	
Emergency <sup>a</sup>	46 (86.8)	7 (13.2)	
Marital Status			0.83
Single	154 (83.2)	31 (16.8)	
Married <sup>a</sup>	108 (85.0)	19 (15.0)	
Residence status			0.07
Not a house owner	168 (80.8)	40 (19.2)	
House owner <sup>a</sup>	89 (89.9)	10 (10.1)	
Employment			0.57
Government	252 (84.3)	47 (15.7)	
Government + Locum <sup>a</sup>	11 (78.6)	3 (21.4)	
Dengue cases/ week			0.35
<1	18 (81.8)	4 (18.2)	
1 to 5	119 (87.5)	17 (12.5)	
6 to 10	47 (78.3)	13 (21.7)	
>10 <sup>a</sup>	78 (83.9)	15 (16.1)	

<sup>a</sup> Reference category

Table V: Predictors of burnout using multiple logistic regression

Socio-demographic and work characteristic	Adjusted Odd ratios (95% Confidence Interval)	P-value
Age	1.037 (0.824 – 1.305)	0.757
Working Hours per week	1.001 (0.977 – 1.027)	0.908
Income	1 (0.999 – 1.001)	0.833
DASS-21		
Depression	0.898 (0.830 – 0.971)	0.007
Anxiety	1.079 (0.989 – 1.176)	0.086
Stress	0.897 (0.810 – 0.994)	0.037
Qualification		
Houseman	1.054 (0.054 – 20.437)	0.972
Medical officer	1.582 (0.148 – 16.924)	0.704
Specialist <sup>a</sup>	1	0.68
Residence		
Not a house owner	2.144 (0.6 – 7.669)	0.241
House owner <sup>a</sup>	1	

<sup>a</sup>Reference category

130 (41.5%) respondents showed high emotional exhaustion, 90 (28.8%) showed moderate emotional exhaustion, and 93 (29.7%) showed low emotional exhaustion. Majority of the respondents (35.5%) showed high depersonalisation, while 102 (32.6%) showed moderate depersonalisation, and 100 (31.9%) showed low depersonalisation. 192 (61.3%) respondents showed low personal accomplishment and 75 (24%) showed moderate personal accomplishment. Only 46 of them (14.7%) showed high personal accomplishment. Specifically, high degree of burnout is represented by high scores of emotional exhaustion and depersonalisation with low scores of personal accomplishment.<sup>2</sup> In our study, 50 (15.9%) respondents were experiencing high degree of burnout (Table III).

#### **Degree of burnout by socio-demographic and work characteristics**

The prevalence of high degree of burnout was significantly higher in respondents with longer working hours ( $p < 0.05$ ). It was also significantly higher in respondents with symptoms of depression, anxiety, and stress ( $p < 0.001$ ). However, there was no significant association between number of cases seen per week and high burnout ( $p = 0.35$ ). There was no significant association between high burnout and other socio-demographic variables (Table IV). Table V shows the predictors of burnout via multiple logistic regression. Overall, depression and stress were identified as the predictors for burnout.

#### **DISCUSSION**

To the best of our knowledge, this is the pioneer study on the prevalence of burnout and its correlation with symptoms of depression, anxiety, and stress among doctors managing patients with dengue infection. This cross-sectional study of doctors involved in managing patients with dengue infection revealed a high degree of severe burnout at 15.9%. However, there was no significant correlation between the number of dengue cases reviewed per week and the degree of high burnout. We postulated that maybe due to difference in the number of cases seen by each doctor as well as the prevalence of dengue cases in each respective hospital. Furthermore, the severity of dengue infection, which may also contribute to the

degree of burnout among the physicians, was not included in our study protocol.

Several other factors that significantly contributed to the degree of burnout were identified. These factors included working hours per week, presence of symptoms of depression, anxiety, and stress, which were statistically significant in relation to high degree of burnout. Long working hours was a significant factors contributing high degree of burnout and this was similar to those reported in several previous studies.<sup>7,8</sup> Thus, reducing the working hours will help to curb burnout among our doctors.

Looking from a different aspect, 130 (41.5%) respondents showed high emotional exhaustion and 111 (35.5%) respondents showed high depersonalisation with a very high proportion of respondents (192 or 61.3%) showing low personal accomplishment. These numbers are worrying, as this will affect the doctors' health and their wellbeing, leading to poor quality care delivered to the patients. Overall, the prevalence of severe burnout in this study was higher as compared to previous studies, which ranged from 2.5% to 11.7%.<sup>7,9,10</sup> Working environment, working attitude, and relationship among co-workers are among few factors that need to be studied further in addition to prolonged working hours identified in our study. With regards to working relationship, it was identified as an important factor that contributed to high degree of burnout among health care workers in several studies.<sup>11-14</sup>

A study conducted by Zuraida et al., reported the prevalence of severe burnout among Malaysian junior doctors was 26.5%.<sup>15</sup> In that study, however, the authors used the abbreviated Maslach Burnout Inventory (aMBI) and the study population was limited to junior doctors, where the high levels of burnout were found among those who have started working for less than six months and those working in the trauma and emergency unit.<sup>15</sup> In contrast, our study population was more diverse and different group of doctors were included, ranging from house officer to specialist.

Comparing our results with the study done among 7288 physicians in the United States (US) assessed using the MBI,

37.9% of US physicians had high emotional exhaustion, 29.4% had high depersonalisation, and 12.4% had a low sense of personal accomplishment.<sup>16</sup> Our results show relatively higher percentages in each of the component of the MBI. These conflicting results may reflect different workplace circumstances in different countries.

Our study also looked for clinical variables that could be valid predictors of severe burnout. Among those assessed included age of respondents, income, working hours per week, qualifications of the clinicians, the status of house ownership and in particular the DAS scores. There seems to be a significant and positive correlation with depression (OR 0.898,  $p=0.007$ ) and stress (OR 0.897,  $p=0.037$ ). Other clinical variables did not seem to influence the prevalence of burnout.

There are several limitations in our study. The small sample size ( $n=313$ ) and the study being a cross-sectional study, limits the ability for us to conclude the positive causal relationship between severe burnout with depression or stress and the number of dengue cases seen. Participation in this study was limited to two urban and two suburban hospitals with specialists, and therefore, future studies should include other hospitals in Malaysia as well as include the prevalence of dengue infection in each hospital studied. We did not assess the impact based on the severity of the dengue cases on the prevalence of burnout. Future studies should also include other diseases to be explored in relation to burnout syndrome among clinicians especially in our local setting. There were also some questionnaires with incomplete or ambiguous information, which were inevitably excluded from the analysis of the results. Other issues such as working environment and working attitude were not included as part of the study which may affect the overall outcome.

## CONCLUSION

Despite negative correlation between the number of dengue cases reviewed per week and the degree of high burnout, we identified other significant correlations with symptoms of depression and stress and these will require early identification to enable early measures to resolve, as well as prevent it. Future studies with more hospitals involvement should be conducted to establish the relationship between the degree of burnout syndrome and prevalence of dengue infection.

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## CONFLICTS OF INTEREST

None

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