

## Original Article

# Prevalence and associated factors of stress, anxiety and depression among emergency medical officers in Malaysian hospitals

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**BACKGROUND:** Demanding profession has been associated with poor psychological health due to multiple factors such as overworking hours and night shifts. This study is to determine prevalence and associated factors of depression, anxiety and stress among medical officers working at emergency department in Malaysian hospitals.

**METHODS:** A cross-sectional study was conducted on 140 emergency department medical officers working at general hospitals from seven Malaysia regions. They were randomly selected and their depression, anxiety and stress level were measured by the 21-item Depression, Anxiety, Stress Scale.

**RESULTS:** The highest prevalence was anxiety (28.6%) followed by depression (10.7%) and stress (7.9%). Depression, anxiety and stress between seven hospitals were not significantly different ( $P>0.05$ ). Male medical officers significantly experienced more anxiety symptoms than female medical officers ( $P=0.0022$ ), however depression and stress symptoms between male and female medical officers were not significantly different ( $P>0.05$ ). Depression, anxiety and stress were not associated with age, working experience, ethnicity, marital status, number of shifts and type of system adopted in different hospitals ( $P>0.05$ ).

**CONCLUSION:** The prevalence of anxiety was high, whereas for depression and stress were considerably low. Gender was the only factor significantly associated with anxiety. Other factors were not associated with depression, anxiety and stress. Future research should aim to gain better understanding on unique factors that affect female and male medical officers' anxiety level in emergency setting, thus guide authorities to chart strategic plans to remedy this condition.

**KEY WORDS:** Medical officers; Emergency department; Depression; Anxiety; Stress

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## INTRODUCTION

Medicine is psychologically demanding field and associated with suboptimal psychological health.<sup>[1–5]</sup> The demand is even higher in the emergency medicine setting due to the patient overcrowding with resource scarcity,<sup>[6]</sup> constant exposure to noise pollutants, multi-tasking and continuous interruption due to dynamic changes of patient conditions,<sup>[6]</sup> hence contribute to loss of concentration and high mental exhaustion.<sup>[7]</sup> In 1997,

77.5% of 40 house officers in a public hospital was reported to experience emotional distress<sup>[8]</sup> and 14 years later, 31% of 42 house officers in a teaching hospital reported to experience psychological distress.<sup>[9]</sup> Recently, two studies reported a high prevalence of depression (42.9%), anxiety (60.7%–63.7%) and stress (57.1%) among house officers working in Malaysia.<sup>[10,11]</sup> The reported percentages were high as compared to the findings from the Western countries in which the prevalence of

psychological distress ranged from 7% to 29%.<sup>[12]</sup>

It is important to note that poor psychological health will lead to negative ramifications on healthcare workers either at personal or professional level. At personal level, poor psychological health will lead to diminished commitment and broken relationships,<sup>[13]</sup> substance abuse,<sup>[14]</sup> committing suicide,<sup>[15]</sup> and developing physical illnesses such as cardiovascular diseases,<sup>[16,17]</sup> musculoskeletal diseases<sup>[18]</sup> and metabolic diseases.<sup>[19]</sup> At professional level, poor psychological health will lead to communication breakdown, decreased clinical competency, vulnerable to clinical errors,<sup>[20,21]</sup> absenteeism, increase turnover,<sup>[22]</sup> and poor job performance.<sup>[23]</sup> These unwanted consequences due to poor psychological health will affect the quality of patient care and safety. Therefore, early recognition of mental illness among healthcare workers is important to address these situations. Despite these reports, none of the study was carried out at the national level (i.e., across Malaysia regions) to explore the prevalence of stress, anxiety and depression and its associated factors among medical officers working at emergency setting.

This study was designed to answer two important research questions: (1) what are the prevalence of depression, anxiety and stress among medical officers in ED? and (2) what are the associated factors of depression, anxiety and stress among medical officers in ED? The study findings will provide useful data to provide better understanding on factors associated with the psychological health.

## METHODS

A cross-sectional study was carried out on emergency medical officers in the general hospitals from seven Malaysia regions; two hospitals from the west region (Hospital Kuching, Hospital Queen Elizabeth), one hospital from the northern region (Hospital Sultanah Bahiyah), two hospitals from the central regions (Hospital Raja Permaisuri Bainun, Hospital Kuala Lumpur), one hospital from the southern region (Hospital Sultanah Aminah) and one hospital from the east coast region (Hospital Sultanah Zahirah). These hospitals represented the state tertiary center with the utmost number of medical officers in ED. Two hospitals employ computerized system and the five hospitals employ manual system for patient's clerking entry. Prior to the study the ethical approval was obtained from the Human Research Ethics Committee (HREC) USM and from Institutional Review Board<sup>[24]</sup>/Medical Research

Ethic Committee (MREC) of National Medical Research Register (NMRR).

The reference population was all ED medical officers at the respective hospital at the data collection point. The estimated sample size was calculated based on Krejcie and Morgan sample size table Krejcie and Morgan.<sup>[25]</sup> The estimated sample size was 140, simple random sampling was performed to recruit study subjects and their participation to this study was voluntary. The inclusion criteria was any medical officers working at ED for more than 6 months and agree to participate; and the exclusion criteria were any medical officers who has underlying pre-existing psychiatric illness and those who refuse to participate.

The participants were requested to fill in an informed consent form prior to questionnaire administration. The informed consent form consisted information related to the protocol of study, benefit and risk of participating this study, and confidentiality declaration. A set of questionnaire that comprised a demographic profile form and 21-item Depression Anxiety Stress Scale (DASS-21) were administered to the participants through face to face self-administered method. The demographic profile form collected information on age, gender, ethnicity, marital status, duration of working, number of total shifts, number of night shifts and type of system adopted by the hospitals. DASS-21 was administered to measure stress, anxiety and depression level of participants. The participants were requested to fill up the questionnaire and return the questionnaire immediately after completion.

DASS-21 was derived and simplified from the original version of DASS-42. Antony Bielling<sup>[26]</sup> has reported that its concurrent validity and internal accuracy are within acceptable to excellent ranges in identifying depression, anxiety and stress level. It is a self-report scale measuring characteristic attitudes of depression, anxiety and stress, and has been used in diverse settings.<sup>[27]</sup> An important point to be mentioned about DASS-21 usage is that it measures the negative emotional states based on clinical symptoms but not means for clinical diagnosis. There are 21 questions with 7 items for each emotional state. The items for depression scale focus on low mood and low self-esteem, anxiety scale focus on fear response to psychological arousal and the stress scale focus on persistent arousal and tension. DASS-21 questionnaire has been translated into Malay language<sup>[28]</sup> and validated in Malaysian population.<sup>[29]</sup> Based on the manual guidelines, scores from each question were summed up and multiplied by two to sum suit the original 42-items.<sup>[27]</sup>

Any scores of depression, anxiety and stress more than 13, 9, and 18 respectively were considered as caseness.<sup>[5]</sup>

Data analysis was carried out using Statistical Package for the Social Sciences software version 22. Data cleaning was used to detect any missing values, coding error or any illogical data value. Descriptive analysis was performed on variables such as age, gender, ethnicity, marital status, duration of working, number of total shifts, number of night shifts and type of system adopted by the hospitals. Pearson chi-square and Fisher exact tests were performed to determine the association between prevalence of anxiety, depression and stress with the selected factor variables. All statistical test were set at 95% confidence interval whereby *P*-value less than 0.05 were considered as significant difference.

## RESULTS

A total of 140 medical officers participated in this study and each hospital was equally presented. Table 1 shows the majority of emergency medical officers were female (60%), married (50.7%) and Malay (56%).

The highest prevalence among emergency medical officers in Malaysia hospitals was anxiety (28.6%), followed by depression (10.7%) and stress (7.9%).

The prevalence of anxiety was associated with gender, whereby male experienced more anxiety than female (*P*=0.022) (Table 2). However, prevalence of depression and stress between male and female were not different (Tables 3 and 4).

The prevalence of depression, anxiety and stress

among the emergency medical officers were not associated with marital status, age, working experience, ethnic group and patient care system used by the hospitals as summarized in Tables 2, 3 and 4.

Though statistically insignificant, based on author's observation, several important notes can be highlighted:

**Table 1.** Demographic characteristics of emergency department medical officers (*n*=140)

Characteristics	<i>n</i> (%)
States	
Terengganu	16 (11.4)
Sabah	24 (17.1)
Wilayah Persekutuan	20 (14.3)
Perak	20 (14.3)
Johor	20 (14.3)
Sarawak	20 (14.3)
Kedah	21 (15.0)
Age (years)	
20–29	62 (44.3)
30–39	73 (52.2)
≥40	5 (3.5)
Sex	
Male	56 (40.0)
Female	84 (60.0)
Marital status	
Single	68 (48.9)
Married	71 (51.1)
Others	1 (*)
Ethnic	
Malay	79 (56.4)
Chinese	32 (22.9)
Indian	22 (15.7)
Others	7 (5.0)
Experience of working (months)	
6–12	40 (28.6)
13–36	56 (39.9)
≥37	44 (31.3)
Number of shifts (per month)	
Night shifts ( <i>n</i> =86)	6.3 (3.2)
Total of shifts ( <i>n</i> =91)	17.9 (8.3)

\*for analysis purposes, percentage is not included; #Categorical data presented as frequency (%); #Numerical data presented as mean (SD) for normally distributed and median (IQR) if skewed.

**Table 2.** Association of socio demographic factors with anxiety

Associated factors	Outcome, <i>n</i> (%)		$\chi^2$ (df)	<i>P</i> value
	Anxiety	Normal		
Sex			5.250 (1.00)	0.022 <sup>a</sup>
Male	22 (39.3)	34 (60.7)		
Female	18 (21.4)	66 (78.6)		
Status			0.286 (1.00)	0.593 <sup>a</sup>
Single	18 (26.5)	50 (73.5)		
Married	22 (30.6)	50 (69.4)		
Age (years)				0.054 <sup>b</sup>
20–29	13 (32.5)	49 (49.0)		
30–39	27 (67.5)	46 (46.0)	-	
≥40	0 (0.0)	5 (5.0)		
Duration			2.494 (2.00)	0.287 <sup>a</sup>
6–12	8 (19.5)	33 (80.5)		
13–36	19 (33.9)	37 (66.1)		
≥37	13 (30.2)	30 (69.8)		
Ethnic group			0.291 (1.00)	0.590 <sup>a</sup>
Malay	24 (30.4)	55 (69.6)		
Non Malay	16 (26.2)	45 (73.8)		
System used			2.300 (1.00)	0.130 <sup>a</sup>
Manual	33 (82.5)	70 (70.0)		
Fully computerized	7 (17.5)	30 (30.0)		
Total of shifts	25 (29.1)	61 (70.9)	-	0.755 <sup>b</sup>
Night shifts	25 (27.5)	66 (72.5)	-	0.374 <sup>b</sup>

a: Pearson Chi Square test, significant level at 0.05; b: Fisher Exact test, significant level at 0.05.

(1) the married medical officers seem to experience more anxiety than the single medical officers; (2) medical officers who are at the age of 30–39 years old seem to experience depression, anxiety and stress more than the other range of age; (3) medical officers who had working experience between 1 and 3 years at emergency department seem to experience depression, anxiety and stress more than other duration of working experience; (4) non-Malay medical officers seem to experience depression, anxiety and stress more than Malay groups; and (5) medical officers in the hospitals that use manual patient care system seem to experience depression, anxiety and stress more than the hospital that use

computerized patient care system.

The prevalence of depression, anxiety and stress among the emergency medical officers were not associated with the total and night shift number.

## DISCUSSION

In general, the highest occurrence of psychological distress among the ED medical officers in Malaysian hospital was anxiety (28.6%), followed by depression (10.7%) and stress (7.9%). The prevalence of anxiety is higher when compared to the normal population (8.2%).<sup>[30]</sup> However, this finding is consistent with a previous study conducted on

**Table 3.** Association of socio demographic factors with depression

Associated factors	Outcome, n (%)		$\chi^2$ (df)	P value
	Depressed	Normal		
Sex			1.244 (1.00)	0.265 <sup>a</sup>
Male	8 (14.3)	48 (85.7)		
Female	7 (8.3)	77 (91.7)		
Status			0.024 (1.00)	0.876 <sup>a</sup>
Single	7 (10.3)	61 (89.7)		
Married	8 (11.1)	64 (88.9)		
Age (years)			-	0.274 <sup>b</sup>
20–29	4 (26.7)	58 (46.4)		
30–39	11 (73.3)	62 (49.6)		
≥40	0 (0.0)	5 (4.0)		
Working experience (months)			2.118 (2.00)	0.347 <sup>a</sup>
6–12	2 (4.9)	39 (95.1)		
13–36	7 (12.5)	49 (87.5)		
≥37	6 (14.0)	37 (86.0)		
Ethnic group			0.087 (1.00)	0.768 <sup>a</sup>
Malay	9 (11.4)	70 (88.6)		
Non Malay	6 (9.8)	55 (90.2)		
System used			0.00 (1.00)	0.982 <sup>a</sup>
Manual	11 (73.3)	92 (73.6)		
Fully computerized	4 (26.7)	33 (26.4)		
Total of shifts	8 (9.30)	78 (90.7)	-	0.180 <sup>b</sup>
Night shifts	8 (8.79)	83 (91.2)	-	0.151 <sup>b</sup>

a: Pearson Chi Square test, significant level at 0.05; b: Fisher Exact test, significant level at 0.05.

**Table 4.** Association of socio demographic factors with stress

Associated factors	Outcome, n (%)		$\chi^2$ (df)	P value
	Stress	Normal		
Sex			-	0.755 <sup>b</sup>
Male	5 (8.9)	51 (91.1)		
Female	6 (7.1)	78 (92.9)		
Status			0.046 (1.00)	0.829 <sup>a</sup>
Single	5 (7.4)	63 (92.6)		
Married	6 (8.3)	66 (91.7)		
Age (years)			-	0.146 <sup>b</sup>
20–29	2 (18.2)	60 (46.5)		
30–39	9 (81.8)	64 (49.8)		
≥40	0 (0.0)	5 (3.9)		
Duration			0.180 (2.00)	0.914 <sup>a</sup>
6–12	3 (7.3)	38 (92.7)		
13–36	4 (7.1)	52 (92.9)		
≥37	4 (9.3)	39 (90.7)		
Ethnic group			-	0.348 <sup>b</sup>
Malay	8 (10.1)	71 (89.9)		
Non Malay	3 (4.9)	58 (95.1)		
System used			0.04 (1.00)	0.947 <sup>a</sup>
Manual	8 (72.7)	95 (73.6)		
Fully computerized	3 (27.3)	34 (26.4)		
Total of shifts	5 (5.81)	81 (94.2)	-	0.944 <sup>b</sup>
Night shifts	5 (5.49)	86 (94.5)	-	0.751 <sup>b</sup>

a: Pearson Chi Square test, significant level at 0.05; b: Fisher Exact test, significant level at 0.05.

doctors and nurses in Johor, the prevalence of anxiety from 17.9% to 25.4%.<sup>[31]</sup> This figure is lower compared with the prevalence of anxiety among house officers (63.7%)<sup>[10]</sup> and students in Malaysian universities (63%).<sup>[32]</sup> Compared with other countries, similar finding was found in Turkey where there was higher level of anxiety as compared to depression or stress among the ED doctors.<sup>[33]</sup> Despite having differences in its percentage, the prevalence of anxiety is still the highest compared to depression and stress. Conversely, the findings from a multinational study completed in United Kingdom, United States (US) and Australasia showed that the doctors experienced higher work-related stress and depression level than anxiety.<sup>[34]</sup> There were other studies conducted in South East Nigeria among emergency residents<sup>[3]</sup> and in St Barnabas Hospital emergency staffs which showed a high prevalence of depression.<sup>[35]</sup> However, the differences in outcomes are probably contributed by the geographical differences between the east and west countries that have different cultures and working environment.

Pertaining to gender, the male medical officers were significantly more anxiety than female medical officers, however they experience similar depression and stress level. In contrast, previous studies found female experience more anxiety compared to male, however that was conducted on medical student and house officer population.<sup>[11,36,37]</sup> Several possible explanation of this finding include: first, the female medical officers might receive better social support from their surrounding as compared to the male as reported by Bergman et al,<sup>[38]</sup> second, it might be due to higher responsibility and expectation to male emergency medical officers as compared to female,<sup>[39,40]</sup> lastly, it might due to the “feminization of medicine”<sup>[41]</sup> whereby more females dominating the working environment,<sup>[41]</sup> and thus lead to hidden emotional discomfort from males as they have to take order from female medical officers. Nevertheless, no difference was observed for depression and stress between male and female medical officers. One implication of this finding is that the hospital should pay more attention to the sources of anxiety experiences by the male medical officers that need to be addressed appropriately.

A previous study reported that age was a significant factor for decreased depression level<sup>[42,43]</sup> and positively correlated with personal accomplishment and job satisfaction.<sup>[43]</sup> Nevertheless this study showed age was not associated with depression, anxiety and stress level if workload and emotional stress were controlled; Hall et al<sup>[44]</sup> reported that age was not correlated with the decision of changing career pathway due to job satisfaction among the

ED residents. Similar result was reported by a different study conducted among psychosocial workers in German.<sup>[45]</sup> Despite insignificant findings, we found that those with age 30–39 years old showed a higher level of depression, anxiety and stress compared to the other age groups. This finding is opposite to the literatures that suggested younger age be associated with lack of experience and training which might experience more depression symptoms.<sup>[46,47]</sup> One possible explanation for the incongruence is that the working enthusiasm and commitment which completed house officer training remain at high level, but later would reduce gradually over time.<sup>[48]</sup> In addition, in Malaysian setting, medical officers enroll into post graduate training at early 30’s, and therefore the academic requirement lead to increase depressive experience. As for those at age of 40 years and above, most of them are normally involved more in administrative work compared to clinical work. This may contribute to lesser episode of depression, anxiety and stress. Even through there was insignificant findings, the hospital should pay attention to the medical officers at age of 30 to 39 years old as depression pattern seem to be high at this age range.

Consistent with several previous studies,<sup>[1,48,49]</sup> working experience was not associated with depression, anxiety and stress. Similar pattern of finding was observed in other profession, which showed working experience has no correlation to the development of mental health disturbance at workplace.<sup>[50,51]</sup> In contrast, a previous study conducted on house officers in West Malaysia reported that an increased month of working experience was associated with decreased depression level, and it was thought due to the increased coping experience with the task and duties.<sup>[10]</sup> Another study conducted among house officers in US showed depressive symptoms were declined with each successive years during the training process.<sup>[52]</sup> Firth-Cozen's finding did not correlate with the pattern of findings observed in this study whereby, the prevalence of depression, anxiety and stress were more pronounced later and not during the early stage of working. A possible explanation for that might be due to the role conflict in working environment.<sup>[53]</sup> In Malaysia, after the completion of house officer training, they were sent to several hospitals for 1 to 3 years duration. Thus, the frequent migration to a new workplace environment and loss of familiar surrounding might contribute to the increased prevalence of depression, stress and anxiety at later stage of working.<sup>[54]</sup>

Marital status was found to have no association with the prevalence of depression, anxiety or stress among

the medical officers. A previous study has suggested marriage was the protective factor against psychological distress.<sup>[55]</sup> Similarly, this was also reported by a survey among emergency physicians in Canada.<sup>[42]</sup> A study among doctors after a year after their graduation in Norwegian emphasized in having a stable relationship as a strong predictor of not having suicidal thoughts and planning.<sup>[56]</sup> It was reported that having a single life is linked to subject oneself to be more vulnerable towards the occurrence of depression, anxiety and stress among the nurses in Hong Kong.<sup>[57]</sup> On the other hand, a study involving consultants in emergency medicine in United Kingdom has suggested that being married has no role as a protective factor from psychological distress.<sup>[58]</sup> A study<sup>[11]</sup> among Malaysian house officers also found that marital status has no correlation with anxiety prevalence. The inconsistent findings might suggest marital status is contextualized and might be influenced by cultures and norms of the society.

Ethnicity is normally linked with diverse cultural background, and might influence individual ways of coping with problems and stressful events. This study showed ethnicity was not associated with the prevalence of depression, anxiety and stress. This is in line with findings of previous studies<sup>[10,59,60]</sup> conducted in Malaysia which showed no correlation between emotional disturbances and ethnicity. In comparison with international studies, ethnicity was a strong predictor for depersonalization.<sup>[61]</sup> A different study<sup>[62]</sup> showed no correlation towards anxiety and depression. Despite insignificant association, the prevalence of those suffering from depression, anxiety and stress symptoms were observed more among Malay compared with non Malay medical officers. Similar pattern was also observed among medical students from four public universities.<sup>[5,32]</sup> Majorities of studies conducted in Malaysia setting seem to support no correlation between ethnicity and psychological distress. This indicates that stress, anxiety and depression among the medical officers were not due to ethnicity discrimination.

Interestingly, this study provided evidence to support both manual and computerized systems in managing patient's care, which doesn't not impose risk on psychological health. It is worth to note that computerized physicians order entry system have a few advantages such as free handwriting identification problems, better identification on physician's prescriptions, integrated medical record and data entry and able to reduce malpractice related to drugs prescriptions significantly.<sup>[63]</sup> On the other hand, dealing

with system failure and power breakdown are the disadvantages that might need to be faced by the staffs.<sup>[31]</sup> In a different study, it was reported that self-rating skills and typing ability are the predictors for the development of computer's anxiety.<sup>[64]</sup> However, it is difficult to conclude as the number of computer-based patient's care were not selected equally in this study and thus could be a potential bias to the result obtained. A comparative study should be done in future to verify this result.

Amount of total shift work and night shift has no association with the prevalence of depression, anxiety or stress. Despite it is well known that night shift has effects on efficiency of performance, family and social life, fatigue and potentially psychosocial stressor,<sup>[65]</sup> it was not demonstrated in this study. Study conducted among emergency physicians in Pittsburgh showed that night shifts increase the exposure towards reduction of cognitive function and chronic fatigue which may predispose to mental stress.<sup>[66]</sup> In a study performed on paramedics showed similar results in which night shifts has unwanted effects on physical wellbeing and psychological health.<sup>[67]</sup> Possible explanation that might support the different findings are due to the inaccurate self-reporting information obtained from the participants that may compromise the accuracy of the result. However, despite the possible limitation, the result might suggest the shift works well in Malaysia emergency department setting.

Even though this study was made throughout Malaysian large tertiary hospitals with emergency medical officers, the aetiology of depression, anxiety and stress was not identified. This study only looked at the associated factors that highlighted the trends, but fail to explain the underlying reasons of results. Thus it does not offer the researcher the opportunity to clarify the issues. The second limitation is distortion of response. Volunteers may prefer the extreme or moderacy response style especially in rating scale of questionnaire. Negative affectivity bias is one of the known limitations in self-administered questionnaire. This may markedly inflates the correlations between the depression, anxiety and stress with the outcome variables.<sup>[68]</sup> Thirdly, this study was only measured by DASS-21. Even though DASS-21 has excellent psychometric properties, it is important to understand that DASS severity ratings are based on mean population scores obtained from large, relatively heterogeneous samples. It can only be used as a screening tool for depression, anxiety and stress, thus it should not be intended to replace a complete psychological assessment for diagnosis purpose.<sup>[69]</sup>

Beside the limitations, this study provided meaningful data on the overall psychological distress condition of medical officers in the emergency setting. Future research should further explore unique factors that affect anxiety level of female and male medical officers through a qualitative approach. A better understanding on the factors will guide authorities to chart strategic plans to remedy this condition.

## CONCLUSION

The prevalence of anxiety is high, whereas for depression and stress are considerably low. Gender is the only factor significantly associated with anxiety. Other factors are not associated with depression, anxiety and stress. Future research should aim to gain better understanding on unique factors that affect female and male medical officers' anxiety level in emergency setting, thus guide authorities to chart strategic plans to remedy this condition.

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**Contributors:** SNY proposed the study, analyzed the data and wrote the first drafts. All authors contributed to the design and interpretation of the study and to further drafts.

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