RELATIONSHIP BETWEEN JOB FACTORS AND STRESS LEVEL AMONG POSTGRADUATE EMERGENCY MEDICINE TRAINEES IN HOSPITAL UNIVERSITI SAINS MALAYSIA

by

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TABLE OF CONTENTS

ABSTRAK

Pengenalan

Kursus latihan perubatan pascasiswazah merupakan salah satu proses yang memberi kesan tekanan yang tinggi. Menurut satu kajian yang telah dilakukan di Malaysia, sebanyak 36.4% pelatih pascasiswazah mengalami stres.

Objektif

Mengkaji hubungan antara faktor pekerjaan dan tahap stres di kalangan pelatih pascasiswazah Perubatan Kecemasan di Hospital Universiti Sains Malaysia.

Metodologi

Satu kajian keratan rentas telah dijalankan di Jabatan Kecemasan dan Trauma, Hospital Universiti Sains Malaysia, Kelantan antara tempoh September 2014 hingga Mei 2016 melibatkan pelatih pascasiswazah Perubatan Kecemasan. Min skor tekanan dinilai menggunakan soal selidik *Depression, Anxiety, Stress Scale – 21* (DASS – 21) manakala faktor pekerjaan dinilai dengan soal selidik *Job Content Questionnaire* (JCQ). Hubungan antara stres dan faktor pekerjaan ditentukan dengan menggunakan analisis regresi linear mudah serta regresi linear pelbagai.

Keputusan

Seramai 61 orang pelatih pascasiswazah telah menyertai kajian ini. Min skor stres adalah 6.85 ± 2.97. Sebanyak 39.3% pelatih pascasiswazah Perubatan Kecemasan melaporkan mengalami stres (22.9% stres ringan, 11.5% stres serdahana, manakala 4.9% stres teruk). Umur ($p = 0.026$), tahun dalam servis ($p = 0.015$), pertimbangan

kemahiran (p = 0.011) dan permintaan psikologi pekerjaan (p = 0.044) dikenalpasti mempunyai hubung kait dengan stres yang signifikan melalui regrasi linear pelbagai.

Kesimpulan

Majoriti pascasiswazah Perubatan Kecemasan di Hospital Universiti Sains Malaysia mengalami tahap stres normal, manakala 4.9% menglami tahap stres yang teruk. Data menunjukkan umur, tahun dalam servis, pertimbangan kemahiran dan permintaan psikologi pekerjaan merupakan faktor pekerjaan yang menpunyai hubungkait dengan stres.

ABSTRACT

Background

Postgraduate residency training is a stressful process for physicians. Previous study in Malaysia showed 36.4% of postgraduate trainees experienced stress. Academic and performance pressure were the stressors among trainees. A stressful psychological condition may diminish job satisfaction and results in negative attitude towards work, interfere with intrapersonal and interpersonal relationship.

Objective

To study the relationship between job factors and stress level among Emergency Medicine Postgraduate trainees in Hospital Universiti Sains Malaysia (HUSM), Kelantan.

Methodology

A cross-sectional study was conducted in Emergency department, Hospital Universiti Sains Malaysia, Kelantan between the period of September 2014 till May 2016 and involving postgraduate Emergency Medicine trainees. Mean stress score was assessed using Depression, Anxiety, Stress Scale – 21 (DASS – 21) and job factors were evaluated using Job Content Questionnaire (JCQ). Simple linear regression and multiple linear regression analysis were used to determine the association of stress with job factors.

Results

A total of 61 postgraduate trainees were recruited for the study. Their mean stress score was 6.85 ± 2.97. 39.3% of trainees experienced stress (22.9% mild stress, 11.5% moderate stress and 4.9% severe stress). Multiple linear regression showed age ($p = 0.026$), years of service ($p = 0.015$), skill discretion ($p = 0.011$) and psychological job demand ($p = 0.044$) has statistically significant association with stress.

Conclusion

More than half of the Emergency Medicine postgraduate trainees in Hospital Universiti Sains Malaysia experienced normal level of stress and 4.9% suffered severe stress. Age, year of service, skill discretion and psychological job demand were significantly associated with stress among postgraduate Emergency Medicine trainees.

Chapter 1

Introduction

1.0 INTRODUCTION

1.1 Effects of Stress on Health and Occupation

Stress can be defined as the inability to cope or the fear of not coping (Baldwin PJ et al, 1997). Job stress is the harmful physical and emotional response that occurs when the requirements of a job do not match the capabilities, resources or needs of the worker. Occupational stress is a recognised problem among health-care workers, and doctors are considered to be at particular risk. The suicide rate among medical practitioners is higher than among other, similar professional groups (Meltzer, H. *et al.*, 2008).

Increased stress levels tend to lead to burnout or physical illness and to decreased quality of life and reduced ability to provide patient care services (Ruotsalainen, J. H. *et al.*, 2015). This results in increased absenteeism and turnover (Michie, S., 2002). Increased stress is also associated with low job satisfaction and harassment and low levels of involvement in decision-making (Weinberg A *et al.*, 2000) (Okada N *et al.*, 2005). The association of psychological stress with disease has been established, particularly in relation to depression, cardiovascular disease and HIV/AIDS (Cohen S *et al.*, 2007).

1.2 Stress in Postgraduate Training

The first year of postgraduate residency training has been found to be the most stressful year for trainees (Abdulghani, H. M. *et al.*, 2015) (Saini, N. K. *et al.*, 2010). A similar investigation concluded that there is a high level of work related stress among resident doctors registered for postgraduate clinical studies in tertiary hospitals (Rajan, P. and B. Bellare, 2011). A study at the Hospital Universiti Sains

Malaysia reported the prevalence of stress among postgraduate students to be 36.4% (MSB Yusoff *et al.*, 2010). In the study, major stressors were shown to be related to academic and performance pressure.

In Malaysia, the average training duration for clinically-based medical postgraduate study ranges from 4 to 7 years. During this period, most of the postgraduate trainees have to juggle their work, studies, dissertation, and professional examinations with family and personal issues. While they are providing health-care services, trainees are also under constant pressure to fulfil the coursework requirements and to keep up with the latest knowledge in their respective field. This all contribute to putting these individuals at risk for high level of stress.

1.3 Rationale of Study

The field of Emergency Medicine in Malaysia is new in comparison to other medical disciplines. The role of emergency physicians in Malaysia has increased immensely, and the emergency department has shifted from being only a triage centre to become the front line in patient management. The expanding role and consequent increased workload of emergency physicians expose them to increased occupational stress. A stressful psychological condition may diminish job satisfaction and results in negative attitude towards work, interfere with intrapersonal and interpersonal relationship.

Following an extensive literature search, to the best of our knowledge, there is no published study on stress level among emergency medicine trainees in Malaysia. We aim to study the level of stress and evaluate the relationship between stress and job

factors among postgraduate emergency medicine trainees in one tertiary centre in this country.

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Chapter 2

Objectives

2.0 OBJECTIVES

2.1 General Objective

To study the relationship between job factors and stress level among postgraduate Emergency Medicine trainees in Hospital Universiti Sains Malaysia (HUSM).

2.2 Specific Objectives

i. To determine the mean level of stress among postgraduate Emergency Medicine trainees in HUSM.

ii. To determine the associated factors of job-related stress among postgraduate Emergency Medicine trainees in HUSM.

Chapter 3

Manuscript

Relationship between Job Factors and Stress Level among Postgraduate Emergency Medicine Trainees in Hospital Universiti Sains Malaysia

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ABSTRACT

Background

Postgraduate residency training and clinical studies are related to high level of work stress among physicians. There is limited data on the stress levels and the job factors related to stress among emergency medicine postgraduate trainees in Malaysia.

Objectives

We aimed to study the relationship between job factors and stress level among emergency medicine postgraduate trainees in Hospital Universiti Sains Malaysia (HUSM), Kelantan.

Methodology

This was a cross-sectional study conducted in a tertiary postgraduate training centre in Malaysia between September 2014 and May 2016, which involved postgraduate emergency medicine trainees. Level of stress were assessed from scores on the Depression, Anxiety, Stress Scale – 21 (DASS – 21), and job factors were evaluated by using the Job Content Questionnaire (JCQ). Simple linear regression and multiple linear regression were used to determine the relation of stress to job factors.

Results

A total of 61 postgraduate trainees were recruited for the study. Their mean stress score was 6.85 ± 2.97. Over half of trainees experienced normal level of stress, 23% reported mild stress, 11% moderate stress and 5% suffered from severe stress. Multiple linear regression showed that age ($p = 0.026$), years of service ($p = 0.015$), skills discretion ($p = 0.011$) and psychological job demand ($p = 0.044$) had statistically significant associations with stress.

Conclusion

More than half of the Emergency Medicine postgraduate trainees in Hospital Universiti Sains Malaysia experienced normal level of stress and 5% suffered severe stress. Age, year of service, skill discretion and psychological job demand were significantly associated with stress among postgraduate Emergency Medicine trainees.

Keywords

Postgraduate Emergency Medicine, Stress, Job factors

INTRODUCTION

Stress is defined as a 'non-specific response of body to any demand for change'[1]. It can also be defined as the inability to cope or the fear of not coping[2]. Job stress is the harmful physical and emotional response that occurs when the requirements of a job do not match the capabilities, resources or needs of the worker[3]. Occupational stress is a recognised problem among health-care workers, and doctors are considered to be at particular risk[4]. The suicide rate among medical practitioners is higher than among other, similar professional groups[5,6].

Increased stress levels tend to lead to burnout or physical illness and to decreased quality of life and reduced ability to provide patient care services. This results in increased absenteeism and turnover[7,8]. Increased stress is also associated with low job satisfaction and harassment[9] and low levels of involvement in decision-making[10]. The association of psychological stress with disease has been established, particularly in relation to depression, cardiovascular disease and HIV/AIDS[11].

Postgraduate medical training was found to be a stressful period for resident trainees[12].Emergency Medicine trainees showed highest level of stress in comparison to Internal Medicine and Family Medicine counterparts[12]. Several studies also reported the highest level of stress was experienced during the first year of postgraduate training[12,13]. In another study, there was a high level of work related stress among resident doctors registered for postgraduate clinical studies in tertiary hospitals[14]. A study at the Hospital Universiti Sains Malaysia reported the prevalence of stress among postgraduate students to be 36.4%[15]. In the study, the major stressors were found to be related to academic and performance pressures.

In Malaysia, the average training duration for clinically-based medical postgraduate study ranges from 4 to 7 years. Emergency Medicine in the country is considered a relatively new medical specialty in contrast to other specialities. Postgraduate training of Emergency Medicine in the country was started in 1986, and it was the 14th specialty recognized by the Ministry of Health[16]. Since 2004, the medical school for postgraduate training in Emergency Medicine grew from only one school to a total of three medical schools which offers the program.

In general, the Emergency Medicine postgraduate training structure involves a 4-year training program. The program is divided into three phases: namely, phase 1 (year 1), phase 2 (includes year 2 and 3), and phase 3 (year 4)[16]. Phase 1 training includes basic specialty knowledge and clinical skills acquisition. Phase 2 involves supervised specialized apprenticeship program, and in the following final year of training in phase 3 is the specialist in training program. During the 4-year training duration, there are two professional board examinations (during phase 1 and phase 3), phase assessment and dissertation preparation requirement. The aim of this training program is to ensure future Emergency Physicians are adequately trained and well equipped with knowledge and skills to provide emergency services upon completion of training[16].

During the training period, the demand to juggle between work, academic, dissertation and professional examinations with family and personal issues are burdened upon trainees. While they are providing health-care services, trainees are also under constant pressure to fulfil the coursework requirements and to keep up with the latest knowledge in their respective fields. These all contributed to putting this group of individuals at risk for high levels of stress. A stressed psychological

condition may diminish their job satisfaction and result in negative attitudes towards work and towards intrapersonal and interpersonal relationships.

Following an extensive literature search, to the best of our knowledge, there is no published study on stress level among emergency medicine trainees in Malaysia. We aim to study the level of stress and evaluate the relationship between stress and job factors among postgraduate emergency medicine trainees in one tertiary centre in this country.

METHODS

This was a cross-sectional study involving postgraduate Emergency Medicine trainees of the Emergency Department, Hospital Universiti Sains Malaysia, conducted between September 2014 and May 2016. Participants were recruited by convenience sampling. An information leaflet explaining the details of the study was given to potential participants and written, informed consent taken. Potential participants included all emergency medicine postgraduate trainees.

The self-administered questionnaire booklet consisted of three parts. The participant's sociodemographic data was gathered in part one; this included age, gender, marital status, number of children, personal income, years in training and years of service. Part two and three contained the Depression Anxiety Stress Score – 21 (DASS – 21) and the Job Content Questionnaire (JCQ), respectively. Participants were asked to give their responses in the questionnaire booklet within 15 minutes, on the same day that it was distributed. The questionnaire booklet distribution and collection was done by hand.

The Depression, Anxiety and Stress 21 Items Questionnaire (DASS 21) is a shorter version of the DASS 42[17]. It is a set of three self-reported scales designed to measure the negative emotional states of depression, anxiety and stress. Each domains comprises of seven items, assessing the mental health symptoms that are: depression, anxiety and stress. Participants were required to report the presence of any symptoms over the previous one week. The answers were based on a Likert scale of four: 0 point (did not apply to me at all), 1 point (applied to me to some degree, or some of the time), 2 points (applied to me to a considerable degree), or 3points

(applied to me very much, or most of the time). The score was then calculated according to the domain and categorized as normal, mild, moderate, severe or extremely severe based on the DASS manual (Table 1).

The JCQ questionnaire was developed by Kareasek to measure the content of a work tasks[18]. It is one of the most frequently used instruments for psychosocial job analysis. For this study, 21 items from the full version of 49 items are used to measure the three major scales of job factors which are: decision latitude (consists of 8 items), psychological job demands (consists of 7 items), and social support (consists of 6 items). The answers were scored on a Likert scale of 1 to 4 (strongly disagree, disagree, agree and strongly agree; or often, sometimes, rarely and never) and the total scores were calculated based on Karasek's recommended format.

Data collected were analysed using the Statistical Package for Social Sciences (SPSS) Version 22 (SPSS Inc, Chicago, IL, USA). All values were tested for normal distribution and equal variance. Demographic data and stress scores were analysed using descriptive analysis, frequency and percentage, mean values and standard deviation (SD).

The dependent variable was the stress score. Independent variables included age, gender, marital status, number of children, personal income, years in training, years of service, skills discretion, decision authority, psychological job demands, co-workers' support and supervisor support. A p-value < 0.05 was taken as the cut-off for statistical significance. The relationships between job factors and stress were analysed using multiple linear regression.

Data exploration and simple linear regression were conducted for all variables. In the multiple linear regression analysis, stepwise and backward procedures were performed on all job factors and socio-demographic data to obtain a preliminary main effect model. The model was also tested for two-ways interaction and multi-collinearity.

The study was approved by the Research and Ethical Committee, School of Medical Sciences, Universiti Sains Malaysia [Ref no: USM/JEPeM/15030088] and was conducted in accordance with the guidelines of the International Conference on Harmonization (ICH).

RESULTS

Demographic Data

A total of 61 postgraduate emergency medicine trainees completed the questionnaire. All the trainees participated in the study. There were slightly more male trainees (59%) (Table 2). Their mean age was 32.2 years (SD 2.13). Sixty percent of the trainees were married. The mean number of children was 1 (SD 1). The mean duration in service was 6.7 years (SD 1.74) and the mean personal annual income was RM 6226.16 (SD 1244.01).

Stress and Job Characteristics

Of the 61 trainees who were practicing in the Hospital Universiti Sains Malaysia, over half were experiencing normal levels of stress, 23% reported mild stress, 11% moderate stress, and 5% had severe stress. Table 3 shows simple linear regression (SLR) analysis of the socio-demographic factors, the job factors and stress levels. Skills discretion was found to be associated with stress ($p = 0.017$).

With multiple linear regression analysis, age ($b = -0.57$ (95% CI -1.07 - -0.07) $p = 0.026$), years in service ($b = 0.79$ (95% CI 0.16 - 1.42) $p = 0.015$), skills discretion ($b = 0.27$ (95% CI -0.48 - -0.06) $p = 0.011$) and psychological job demands ($b = 0.04$ (95% CI 0.09 - 0.64) $p = 0.044$) were associated with stress among trainees (Table 4).

There was a negative relationship between age and stress score. For example, an increase of 1 year of age reduced the stress score by 0.57. It follows that with an

increase of 10 years of age the stress score was reduced by approximately six units (b = 0.57, (95% CI -1.07 - -0.07) therefore, 10. 0.57 = 5.7 ~ 6).

DISCUSSION

Emergency and critical care of patients invariably takes place in a stressful working environment. The provision of immediate intervention to patients attending the emergency department demands knowledge and skills and patients have to be managed within a limited time. Stressors experienced by trainees in Emergency Medicine are distinct from other specialty, these include sleep deprivation, patient overload, low status in hospital hierarchy and lack of negotiation skills[19]. 39.3% of trainees experienced mild to severe stress in this study. This finding is almost similar to report by Saini, N.K. et al. where the overall prevalence of stress among resident doctors pursuing postgraduate study was 32.8%[13].

Age was found to be statistically significant contributor to stress. Our finding differ from other studies conducted among Emergency Medicine trainees, where age was not found to be a factor to stress[12,13,20]. We postulate the greater stress experienced by younger trainees may be due to inadequate clinical experience and skills, the lack of authority in decision making and their weaker stress coping mechanisms.

The years in service was found to be positively associated with stress among trainees. Contrary to the earlier finding of younger age contributes to more stress, the delay of enrolment into postgraduate study which translates into longer duration in service, may have contributed this to be a stressor during training. Trainees who are admitted later into the program would encounter a step down in seniority ranks in postgraduate studies, despite registered more years of working experience. These trainees will also assume new role of responsibility, higher work load, in addition to

academic needs and patient care during training, which can create more stress. The selection criteria for enrollment into Emergency Medicine postgraduate training is determined by the medical school and Management Unit of the Ministry of Health for specialty training. Potential candidate must possess at least two years of clinical experience after graduation, and further selection is based on pre-entry assessment examination and merit points. The strict requirements for trainee selection ensures only the best candidate is chosen. Hence, the years in service does not guarantee entrance into training. Trainee may only be accepted after multiple attempts, which may also become a potential source of stressor upon successful entrance into postgraduate study.

The concept of decision latitude comprises two constructs: decision authority, referring to the employee's authority to make job related decisions; and skills discretion, which measures the extent of the skills that employees use on the job[18]. Skills discretion is defined as the level of skills and creativity required on the job and the flexibility which permits the worker to decide which skills to employ and when to learn new things[18]. In this study, the higher the level of skills discretion, the lower the stress scores.

This finding is similar to that of two previous studies. In the study at Universiti Kebangsaaan Malaysia, skills discretion had a negative correlation with stress among assistant medical officers[21]. Similarly, among lecturers in the School of Medical Sciences, Universiti Sains Malaysia, a lower stress score correlated with higher skills discretion[22].

With the emergence of evidence-based medicine, new instruments and updates in the management of critically ill patients are constantly being presented and trainees need to adapt to the new skills and knowledge. Flexibility in learning and the ability to make clinical decisions translates into better work performance. With higher skills discretion lower levels of stress are experienced.

The emergency department provides an around-the-clock clinical service, regardless of the time of day. Prompt clinical judgements and quick clinical decision making are needed to provide timely interventions for every ill patient. At the same time, critical care patients are frequently managed in the department due to access problem.

Excessive workloads and time constraints may jeopardize the care of patients. Psychological job demands and decision latitude were positively associated with psychosocial well-being (mental health) among emergency medical and nursing staff in Spain[23]. However, in this study the mental health assessment was measured by the Short Form (36) Health Survey instead of DASS 21. Three other studies also found positive associations between psychological job demands and stress[21,24,25]. In these studies, the stress levels were measured by DASS, which was similar to our study.

There are several limitations to our study. This was a single centre, cross sectional study involving only one postgraduate training group. Together with the small sample size, the results may not represent the true level of stress experienced by the full population of trainees. Data collection during the study duration reflects only the level of stress of each participant at a single point in time, and from this a

true estimation of stress levels cannot be attained. Possible misinterpretation of questions and to a lack of direct communication is another limitation of a self-administered, questionnaire-based study.