

**PSYCHOLOGICAL STATUS AMONG
EMERGENCY DEPARTMENT PERSONNEL
IN HOSPITAL UNIVERSITI SAINS MALAYSIA**

By:

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ABSTRACT

PSYCHOLOGICAL STATUS AMONG EMERGENCY DEPARTMENT PERSONNEL IN HOSPITAL UNIVERSITI SAINS MALAYSIA

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Objective: The aim of this study is to determine the psychological status, particularly level of depression, anxiety and stress level among Emergency Department personnel in Hospital Universiti Sains Malaysia and its association to demographic factors.

Methods: This prospective cross-sectional study was conducted in Emergency Department (ED) Hospital Universiti Sains Malaysia from March to June 2014. A total of 122 personnel from the ED who fulfilled the inclusion criteria were included in the study. Each personnel was given a set of questionnaire consisting demographic background and the DASS 21 form. Demographic factors assessed were age, gender, race, profession and years of working experience.

Results: The results from 122 personnel showed a total of 2 personnel (2%) recorded score for moderate depression, 5 personnel (4%) recorded for moderate anxiety and 3 personnel (2%) recorded for severe anxiety. No personnel recorded for moderate-severe stress. Among the demographic factors tested, statistically significant associations were found between stress levels with age, profession and working experience of personnel. Significant associations were also found between depression levels with the gender of personnel.

Conclusion: The psychological status, particularly depression, anxiety and stress level among ED personnel were generally low. The stress level was noted to be most affected by demographic factors compared to depression and anxiety.

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AKU JANJI

Diperakui bahawa disertasi yang bertajuk PSYCHOLOGICAL STATUS AMONG EMERGENCY PERSONNEL IN HOSPITAL UNIVERSITI SAINS MALAYSIA merupakan hasil kerja dan penyelidikan yang asli dari FAIRRUL BIN KADIR, nombor kad pengenalan 830103-12-5299, nombor matriks PUM 0014/12, dari tempoh 2012 hingga 20156 adalah di bawah penyeliaan kami. Disertasi ini merupakan sebahagian daripada syarat untuk penganugerahan SARJANA PERUBATAN KECEMASAN. Segala hasil penyelidikan dan data yang diperoleh adalah hak milik terpelihara Universiti Sains Malaysia.

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Universiti Sains Malaysia

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LIST OF ABBREVIATIONS

AMO	Assistant Medical Officer
BDI	Beck Depression Inventory
BM	Bahasa Malaysia
CBT	Cognitive-Behavioural Therapy
CESD	Centre for Epidemiologic Studies Depression
ECT	Electroconvulsive Therapy
ED	Emergency Department
HUSM	Hospital Universiti Sains Malaysia
IPT	Interpersonal Psychotherapy
MAOIs	Monoamine Oxidase Inhibitors
NHS	National Health Service
PDS	Posttraumatic Diagnostic Scale
PST	Problem-Solving Therapy
PTSD	Post-Traumatic Stress Disorder
SCL-D	Symptom Checklist - Depression
SSRIs	Selective Serotonin Reuptake Inhibitors
SNRIs	Serotonin/norepinephrine Reuptake Inhibitors
TCAs	Tricyclic Antidepressants
UK	United Kingdom
US	United States
WHO	World Health Organization

ABSTRAK (BAHASA MALAYSIA)

KEADAAN PSIKOLOGI DI KALANGAN KAKITANGAN JABATAN KECEMASAN HOSPITAL UNIVERSITI SAINS MALAYSIA (HUSM)

OBJEKTIF KAJIAN:

Kajian ini bertujuan untuk menentukan keadaan psikologi khususnya tahap kemurungan, kebimbangan dan tekanan dikalangan kakitangan Jabatan Kecemasan di HUSM serta hubungannya dengan faktor-faktor demografi.

KAEDAH:

Kajian 'prospective cross sectional' ini telah dijalankan di Jabatan Kecemasan Hospital Universiti Sains Malaysia dari Mac sehingga Jun 2014. Sebanyak 122 kakitangan yang memenuhi kriteria inklusi telah disertakan dalam kajian ini. Kakitangan yang terlibat telah diberikan borang soal selidik yang terdiri daripada borang DASS 21 dan borang latar belakang demografi. Faktor demografi yang dinilai adalah umur, jantina, bangsa, jenis pekerjaan dan tahun pengalaman bekerja.

KEPUTUSAN:

Keputusan daripada 122 kakitangan menunjukkan bahawa terdapat 2 kakitangan (2%) yang merekodkan tahap kemurungan sederhana, 5 kakitangan (4%) merekodkan tahap kebimbangan sederhana dan 3 kakitangan (2%) merekodkan tahap kebimbangan teruk. Tidak ada kakitangan yang merekodkan tahap tekanan sederhana-teruk. Antara faktor demografi yang dikaji, didapati tahap tekanan mempunyai hubungan yang signifikan dengan umur, jenis

pekerjaan dan pengalaman bekerja kakitangan. Terdapat juga hubungan signifikan antara kemurungan dengan jantina kakitangan.

KESIMPULAN:

Tahap psikologi, khususnya kemurungan, kebimbangan dan tekanan dikalangan kakitangan Jabatan Kecemasan di HUSM secara umumnya adalah rendah. Tekanan didapati banyak dipengaruhi oleh faktor demografi berbanding kemurungan dan kebimbangan.

ABSTRACT (ENGLISH)

PSYCHOLOGICAL STATUS AMONG EMERGENCY DEPARTMENT PERSONNEL IN HOSPITAL UNIVERSITI SAINS MALAYSIA

OBJECTIVE:

The aim of this study is to determine the psychological status, particularly level of depression, anxiety and stress level among Emergency Department personnel in Hospital Universiti Sains Malaysia and its association to demographic factors.

METHODS:

This prospective cross-sectional study was conducted in Emergency Department (ED) Hospital Universiti Sains Malaysia from March to June 2014. A total of 122 personnel from the ED who fulfilled the inclusion criteria were included in the study. Each personnel was given a set of questionnaire consisting demographic background and the DASS 21 form. Demographic factors assessed were age, gender, race, profession and years of working experience.

RESULTS:

The results from 122 personnel showed a total of 2 personnel (2%) recorded score for moderate depression, 5 personnel (4%) recorded for moderate anxiety and 3 personnel (2%) recorded for severe anxiety. No personnel recorded for moderate-severe stress. Among the demographic factors tested, statistically significant associations were found between stress levels with age, profession and working experience of personnel. Significant associations were also found between depression levels with the gender of personnel.

CONCLUSION:

The psychological status, particularly depression, anxiety and stress level among ED personnel were generally low. The stress level was noted to be most affected by demographic factors compared to depression and anxiety.

CHAPTER 1: INTRODUCTION

Family and work are the two factors from which most working adults derive satisfaction in life; equally they are also the most common sources of stressful experiences which may affect each other. The working environment continues to change with globalization of the world economy and economic rationalisation driving job restructuring, greater part-time and contract work and greater workload demands that commonly occur in a context of higher job insecurity. Therefore, working conditions have become so complicated that undeniably it has become increasing source of health complication mentally and physically.

A healthy job is when the pressure applied on employees are balanced to their abilities and resources, to the support they receive from people who matter to them and to the amount of control they have over their work. As health is not merely the absence of disease or infirmity but a positive state of complete physical, mental and social well-being (World Health Organization, 2003). Thus, a healthy working environment is one in which there is not only an absence of harmful conditions but full of health-promoting ones.

Pressure at the workplace is unavoidable due to the increasing contemporary demands of the work environment. When pressure perceived as acceptable by an individual, it may keep employees motivated, alert, and able to work and learn, depending on the personal characteristics and available resources (World health Organization, 2015b). However, when that pressure becomes excessive and unmanageable, it may lead to stress and further psychological distress. Work-related stress is the response people may have when presented with work demands and pressures that are not matched to their knowledge and abilities and

which challenge their ability to cope (Leka *et al.*, 2004). Stress occurs in a wide range of working conditions and circumstances but is often made worse when employees feel they have less control over their work as well as little support from supervisors and colleagues.

Most of the causes of work stress are much related to how the organization is designed and how the work is managed. These aspects of work have the potential to cause harm and can be viewed in terms of work content and work context (Leka *et al.*, 2004). Work content ranges from job content, workload, work pace, working hours and work control. On the other hand, work context includes career development, salary, role in an organization, interpersonal relationship and home-work interface. Pressure in any of these work aspects may easily elicit stress, affecting other aspects as well and influence work productivity as a whole.

The complication of work-related stress include the effects on work satisfaction, decrease productivity, mental and physical health, wider impact on family function and finally career longevity. While anxiety and depression are the most likely adverse psychological outcome, the range of other possible psychological problems includes burnout, alcohol abuse, absenteeism, chronic fatigue and accidents, sick building syndrome, repetitive strain injury and post-traumatic stress disorder (Hotopf and Wessely, 1997). Stress-related physical illnesses also include coronary heart disease, migraine, hypertension, irritable bowel syndrome and musculoskeletal problems (Johnson *et al.*, 2005).

Healthcare services have been well known to be related with high occupational stress. Due to the nature of the work and other demanding factors, healthcare personnel from doctors, nurses to supporting staff experience a continuous increase in work-related stress and its complications. This can especially be seen in those who practise in the critical care

specialty such as in Emergency Department (ED) where personnel are exposed to a variety of stressors. Thus, it is undeniable that the ED personnel are at a higher risk of psychological distress compared to other departments (Yates *et al.*, 2011).

Multiple factors may play a role in this. Firstly, personnel in ED had to work in a highly charged atmosphere that is overloaded with sensory stimuli all in a framework of urgency that may change dramatically from one minute to the next. Apart from the high influx of patients to the ED, personnel are required to make critical decision to differentiate between stable and unstable patients and promptly deliver early interventions (Brenner and Simon, 1984). As decisions are not easily reversible and risks of missing certain important points in patient's condition remain high, the fear of making an irrevocable mistake is always present (Rosen *et al.*, 1983).

Patients presented to the ED are also in variable conditions from the critically ill patients with septic shock or road traffic accident to simple sprained ankle or cough (Phipps, 1988). At times, patients may also come with rare and confusing presentations and require a long list of examinations and investigations. These wide varieties of cases without doubt will create strain as it requires an extensive amount of time, work and concentration. Personnel are also under the pressure to maintain updated with the latest treatments and guidelines.

Frequently, the influx of patients to the ED may increase drastically exceeding the actual capacity. This is due to many patients seemed to regard the ED as the first line of delivery for health and social services despite whatever the case is. About half the cases seen in the ED are not considered true emergencies (Bartolucci and Drayer, 1973). However, ED is not allowed to deny admissions and personnel are obliged to attend all patients despite

whatever the ED conditions maybe (Ministry of Health, 2012). Thus, ED will become overcrowded, hectic and workload will increase. On top of that, ED personnel need to perform extra role by controlling patient's flow, manage bed capacity and push for early admissions. Conditions as these may put personnel under stress and if constantly exposed may lead to psychological distress (Maslach *et al.*, 1986).

In Malaysia, the field of Emergency Medicine is relatively still new. Due to the non-existence of proper academic activities regarding the emergency care systems, Malaysia was categorized as an underdeveloped emergency care systems country in 1999 (Arnold, 1999). However, things have changed since the first locally trained emergency physicians graduated in 2002 and introduced into the Malaysian health services (Hisamuddin *et al.*, 2007). With the introduction of emergency physicians, the emergency medical services in Malaysia greatly improved and expanded. Malaysian ED was no longer just a triaging centre but the first liner in patient's acute management and stabilization. Their roles also have been extended to cover other areas as well such as in pre-hospital care, disaster management and emergency medical coordinating centre (Ministry of Health, 2012). The Malaysian College of Emergency Physician was later established in 2011.

With the expanding role of ED and the increasing demand for emergency health services, working environment in ED has become more sophisticated and challenging. ED personnel are also prone for occupational stress and at risk for developing psychological distress. However, up to now no formal study have been done in Malaysia to address this issue. As poor psychological condition may diminish job performance, reduce productivity and affect department's services, it is about time that such study to be conducted in our own

local ED settings and conditions. Hopefully with the outcome of this study we may be able to identify the problems objectively and come up with proper solutions later.

CHAPTER 2: LITERATURE REVIEW

2.1 Depression

2.1.1 Overview of Depression

Depression is a common mental disorder, characterized by sadness, loss of interest or pleasure, feelings of guilt or low self-worth, disturbed sleep or appetite, feelings of tiredness and poor concentration (World health Organization, 2015a). It can be recurrent or chronic, leading to impairment of a person's ability to function at work or school, or cope with daily life. At its most severe, depression may lead to suicide.

The common features of the depressive disorders are the presence of sad, empty, or irritable mood, accompanied by somatic and cognitive changes that significantly affect the individual's capacity to function. What differs among them are issues of duration, timing, or presumed aetiology (American Psychiatric Association, 2003). Most patients with major depressive disorder present with a normal appearance. In patients with more severe symptoms, a decline in grooming and hygiene may be observed as well as a change in weight.

In the Diagnostic Statistical Manual of Mental Disorders, Fifth Edition (DSM-5) by American Psychiatric Association (2003), depression disorder is classified into disruptive mood dysregulation disorder, major depressive disorder (including major depressive episode), persistent depressive disorder (dysthymia), premenstrual dysphoric disorder, and depressive disorder due to another medical condition.

Major depressive disorder is the most severe form of depression. The criteria for major depressive disorder are at least 5 of the following symptoms to have been present during the same 2 week period with at least 1 of the symptoms must be diminished interest/pleasure or depressed mood (American Psychiatric Association, 2003):

1. Depressed mood: for children and adolescents, this can also be an irritable mood.
2. Diminished interest or loss of pleasure in almost all activities (anhedonia).
3. Significant weight change or appetite disturbance: for children, this can be failure to achieve expected weight gain.
4. Sleep disturbance (insomnia or hypersomnia).
5. Psychomotor agitation or retardation.
6. Fatigue or loss of energy.
7. Feelings of worthlessness.
8. Diminished ability to think or concentrate; indecisiveness.
9. Recurrent thoughts of death, recurrent suicidal ideation without a specific plan, or a suicide attempt or specific plan for committing suicide.

The specific cause for depressive disorder is not known. As with most psychiatric disorders, depressive disorder also happens to be a heterogeneous and multifactorial group of disorders involving both environmental and genetic factors. Medical illness, psychosocial stress and chronic pain can also play a role in depressive disorder. Common psychosocial risk factors for depression are impaired social supports, negative life events, bereavement and loneliness (O'Hara *et al.*, 1984).

In all patient populations, the combination of medication and psychotherapy generally provides the quickest and most sustained response (Ishak *et al.*, 2011; Pampallona *et al.*, 2004). Pharmacotherapy drugs commonly used for the treatment of depression include selective serotonin reuptake inhibitors (SSRIs), serotonin/norepinephrine reuptake inhibitors (SNRIs), tricyclic antidepressants (TCAs) and monoamine oxidase inhibitors (MAOIs) (Panel, 1993).

In addition, evidence-based psychotherapeutic treatments for adults with depression include interpersonal psychotherapy (IPT), cognitive-behavioural therapy (CBT), problem-solving therapy (PST) and behavioural activation (Hollon and Ponniah, 2010). Besides that, electroconvulsive therapy (ECT) is a highly effective treatment for the severe form of depression (Black *et al.*, 1987).

2.1.2 Depression among Emergency Department Personnel

The impact of work-related depression on job satisfaction and career longevity in all branches of medicine is receiving increased attention. Since depression disproportionately affects adults of working age, it has a significant financial impact on businesses (Conradi *et al.*, 2012). At the individual employee level, depression leads to impaired work performance, accidents and sickness absence. Employee suffering with depression report on average 5.6 hours per week of lost time, indicating a serious loss of productivity (Stewart *et al.*, 2003).

Meanwhile at the organisational level, there are likely to effect on staff morale, accidents, absences, staff turnover and productivity (Haslam *et al.*, 2005). A total of 81% from lost productivity time is due to reduced performance while on the job (Parsonage, 2007).

Employees suffering mental health problems such as anxiety are absent from work for health reasons far more often than other employees, and when they have to take leaves, they are away for longer (Co-operation and Development, 2012). Employees absence due to depression is estimated to cost a business an extra 28% on top of the absent employee's wage (Parsonage, 2007).

Healthcare workers are exposed to similar risk in developing mental illness such as depression. In general, healthcare workers have a higher rate for psychological morbidity than the general population; in a large research NHS sample in the UK the relative risk of disorder was 1.5 and was most marked staff involved with direct care (Wall *et al.*, 1997).

In terms of specialty, ED has the potential to be at least as stressful as any other specialty with the increasing rates of burnout and attrition amongst career emergency personnel is becoming apparent. Gallery *et al.* (1992) reported a disproportionate number of emergency physicians in the USA who reported high levels of stress and depressive symptoms and planned to leave the specialty (26.7% within 5 years). At the same time in the UK, the number for staff absences due to psychiatric illnesses including depression at Cardiff and Vale University Health Board climbed from 1154 in 2012 to 1221 in 2013 and continue to rise to 1385 in 2014 (Sisk, 2015).

In order to keep up with the challenges in the ED, personnel need to maintain an optimum condition at all time. However, workers with depression experience cognitive problems, such as indecisiveness (44%), forgetfulness (33%) or difficult to concentrate (57%) during an episode, reducing their level of performance to below the standard expected (Conradi *et al.*, 2012; Ipsos, 2012).

Potential causes of depression among personnel can be derived from the work content and work context of the ED (Leka, Griffiths et al. 2004). At the same time, demographic factors and individual characteristics may also play a significant role.

High job demands and lack of job control are aspects of work content that have been associated with depression. Johnson *et al.* (1995) studied the effects of work control, physician resources, job demands and patient demands in middle-aged medical officers. High job demands were associated with both depression and 'work dissatisfaction' in univariate analyses. In regression analyses, lack of control over work was independently associated with both psychological disorder and dissatisfaction. In another study in the UK, 75% out of 74 healthcare personnel whom experienced depression and anxiety felt that unmanageable workloads had contributed to the development of their mental health problems (Haslam *et al.*, 2005).

Demographic factor which have been associated with depression among ED personnel among others was age. In another study involving emergency physicians in Canada, increased age was significantly associated with decreased scores for depression and depersonalization (Lloyd *et al.*, 1994). Marital status, job and economic condition account for a large part of the variation in depression which decline from early adulthood to middle age (Mirowsky and Ross, 1992). This could be explained as personnel in successively older age groups report greater satisfaction with their jobs, beyond that due to the higher rank and pay that comes with age (Kalleberg and Loscocco, 1983).

Another demographic factor that has been associated with depression in the ED was the gender of personnel. Firth-Cozens (1990) in her study on female house officers from

major cities in the UK reported that 46% were above the criterion for clinical depression. In addition, a study done on 763 emergency physicians from throughout the US revealed that female physicians had a higher level of depression and more likely to leave the specialty over the next ten years (Gallery *et al.*, 1992). Sex-related sources of stress were conflicts between career and personal life, sexual harassment at work, lack of female role models and prejudice from patients and discrimination by senior doctors (Gallery *et al.*, 1992).

The types of profession have also been linked to the prevalence of depression among ED personnel. A comparison study was done in the UK to study the incidence of depression between staff in emergency and orthopaedic department (Yates *et al.*, 2011). The study revealed that 21% of ED doctors scored a significant level of depression and anxiety compared to nurses and admin staff with a total of 6.9% and 4.9% respectively. ED doctors were also more likely to have depression scores at case level by 3.9 times compared to an orthopaedic doctor. Besides doctors, profession as nurses in the ED was also significantly related to depression. A survey in a US university hospital showed that 29% of nurses working in the ED experienced a significant level of depression and burnout (Glass *et al.*, 1993).

Years' experience working in the ED was another demographic that has been frequently associated with the incidence of depression in the ED. Popa *et al.* (2010) in their study on depression, causal factors and coping mechanism among 263 emergency doctors in Romania showed a significant variation of depression with years of working experience. Depression score recorded lowest in the group with <4 years of experience and highest in the group with >7 years of experience.

Meanwhile, a research on nurses from a hospital in the US showed that 35% scored a significant level of depression, with depressive symptoms being inversely related to years employed in the hospital setting and household income (Welsh, 2009). Depressive symptoms were otherwise positively correlated with somatic symptoms, major life events and occupational stress.

2.2 Anxiety

2.2.1 Overview of Anxiety

Abnormal anxiety is an unpleasant emotional sensation due to ‘fear for no adequate reason’ (Fish *et al.*, 2006). The individual frequently has physical symptoms such as palpitations, restless, shortness of breath and increase sweating. Cognitive signs of anxiety include worries or having a sense of something bad but unknown is going to happen. Anxiety could be mild or moderate and free floating to severe, presenting with fear and panic.

In the Diagnostic Statistical Manual of Mental Disorders, Fifth Edition (DSM-5) by American Psychiatric Association (2003) restructured anxiety disorders into 3 groups:

1. Anxiety disorders
 - a. Panic disorder
 - b. Generalized anxiety disorder
 - c. Social anxiety disorder
 - d. Agoraphobia

2. Obsessive-compulsive disorders
 - a. Body dysmorphic disorder
 - b. Trichotillomania (hair-pulling disorder)
 - c. Substance/medication-induced obsessive compulsive and related disorders

3. Trauma and stressor related disorders

- a. Posttraumatic stress disorder
- b. Acute stress disorder
- c. Adjustment disorder

Symptoms vary depending on the type of anxiety disorder, but general symptoms include feelings of panic, fear, and uneasiness, problems sleeping and an inability to be still and calm. People with anxiety also may have palpitations, shortness of breath, dry mouth and sweaty hands and/or feet.

The specific cause of anxiety disorders is unknown. The first possibility is that anxiety is due to a known or unrecognized medical condition. Genetic factors also significantly influence risk for many anxiety disorders. On the other hand, environmental factors such as early childhood trauma can contribute to risk for later anxiety disorders. The debate whether gene or environment is primary in anxiety disorders has evolved to a better understanding of the important role of the interaction between genes and environment (Tambs *et al.*, 2009).

Most presenting anxiety disorders are functional psychiatric disorders. Psychological theories range from explaining anxiety as a displacement of an intrapsychic conflict (psychodynamic models) to conditioning paradigms (cognitive-behavioural models). The psychodynamic theory has explained anxiety as a conflict between the id and ego (Michels *et al.*, 1985). Aggressive and impulsive drives may be experienced as unacceptable resulting in repression. These repressed drives may break through repression, producing automatic anxiety. On the

These repressed drives may break through repression, producing automatic anxiety. On the other hand, cognitive theory has explained anxiety as the tendency to overestimate the potential for danger (Rapee and Heimberg, 1997). Patients with anxiety disorder tend to imagine the worst possible scenario and avoid situations they think are dangerous, such as crowds, heights, or social interaction.

Similar with depression, treatment for anxiety also consists a combination of psychotherapy and/or pharmacotherapy (De Beurs *et al.*, 1999). Antidepressant agents are the drugs of choice in the management of anxiety disorders, particularly the newer agents such as SSRIs. Older antidepressants, such as TCAs and MAOIs, are also effective in the treatment of some anxiety disorders (Bandelow *et al.*, 2012). In addition, behavioural therapy and CBT have demonstrated efficacy through controlled studies (Shear and Beidel, 1998). Deciding which treatment or combination of treatments depends on a careful assessment and interview of the patient's type of anxiety and goals.

2.2.2 Anxiety among Emergency Department Personnel

Workplace anxiety is a learnt response to stress and can be triggered from a range of factors, with some cases more severe and debilitating to the individual than others. It differs from general anxiety disorder as the symptoms are specifically related to the work environment. However, work-related anxieties can manifest in the form of phobia, social anxiety, generalized anxiety, fears of insufficiency, or hypochondriacal anxiety in relation to work, working conditions, or colleagues and superiors.

There is growing evidence that the workplace can have an important role in the development of anxiety problems and disorders. Independent of their nature and origin, anxiety disorders can interfere with the ability of employees to work (Haines *et al.*, 2002). Some common anxieties include fear of interacting with authority figures, fear of speaking out, fear of public humiliation, fear of noticeable nervousness and fear of not performing to the highest standards. Workplace anxiety not only poses a lot of stress on the anxious person but also impair social integration, productivity and participation, as defined in the International Classification of Functioning, Disability and Health (World Health Organization, 2001). When it comes to workplace avoidance, the results are high social costs (Linden and Muschalla, 2007).

Physical and psychological symptoms of anxiety were reported to impair work performance and increase the risk of accidents (Haslam *et al.*, 2005). Physical symptoms of anxiety involved were nausea, headaches, dizziness, trembling, insomnia and lack of energy while psychological symptoms involved were poor concentration, extreme emotional distress, lack of motivation and unable to make decisions.

Healthcare providers, particularly personnel working in the ED are highly at risk to develop anxiety. ED personnel are constantly exposed to work-related stressors such as performing cardiopulmonary resuscitation, high patient morbidity and mortality, addressing the end of life care and daily confrontations with ethical dilemmas.

Apart from the work conditions in the ED, demographic factors and individual characteristics may also have the potential to cause anxiety among personnel. Sun *et al.* (2012) in their study among doctors from various health services in China including those working in the ED showed that level of anxiety varied significantly with age. On the other hand, a survey in Canada found a non-significant association between anxiety with age, number of shifts per month or number of overtime shifts per month. Interestingly, interpersonal conflict was related to anxiety symptoms and nurses felt they were not given proper support from the hospital administrators (Laposa *et al.*, 2003).

Another demographic factor that has been associated with anxiety in the ED is the gender of personnel. As it is well known that women are more susceptible to anxiety disorders compared to men in the general population (World Health Organization, 2009), its prevalence among ED personnel was also similar. Stathopoulou *et al.* (2011) in their study among 213 emergency nurses from hospitals in Greece showed that female nurses had significantly higher levels of anxiety. Based on the Hamilton Anxiety Scale used in the study, 24.8% of the participants reported very severe sleep disturbance, 23.9% reported very severe depressive mood and 10.7% reported very severe anxious mood.

Meanwhile, a study in Turkey on female emergency doctors showed a non-significant but higher level of anxiety compared to their male counterparts (Erdur *et al.*, 2006). This

finding may have been contributed by the conflict endured by female medical personnel between work life and daily life (Komaromy *et al.*, 1993).

The types of profession of ED personnel have also been linked to the prevalence of anxiety. A study by Yates *et al.* (2011) on the anxiety of ED personnel in the UK showed that 21% of ED doctors scored a significant level of depression and anxiety compared to nurses and admin staff with a total of 6.9% and 4.9% respectively. ED doctors were also more likely to have anxiety scores at case level by 2.2 times compared to an orthopaedic doctor. Increased psychological health was associated with the use of problem-focused coping strategies and higher levels of social support at work.

Years' experience working in the ED is another demographic that has been frequently associated with anxiety in the ED. A research on emergency nurses in Greece observed a statistically significant correlation between years of work experience in the ED and anxiety states (Stathopoulou *et al.*, 2011). Nurses overworked at a similar place for an extended period of time was associated with higher prevalence of anxiety and thus recommended for less stressful assignment for a short period of time on a rotational basis.

2.3 Stress

2.3.1 Overview of Stress

Stress has a different meaning for different people under different circumstances. The first and most generic definition of stress was by Selye (1975), 'Stress is the non-specific response of the body to any demand'. Selye (1975) emphasize that that stress was not identical to nervous tension or emotional arousal since stress can also occur in plants and bacteria which have no nervous system.

In behavioural science, stress can be regarded as the perception of threat, with resulting anxiety discomfort, emotional tension and difficulty in adjustment (Selye, 2013). Additionally, in terms of neuroendocrinology, stress can also be defined as any stimulus that will provoke the release of adrenal glucocorticoids and ACTH (URQUHART *et al.*, 1959).

Stress arises when individuals perceive that they cannot adequately cope with the demands being made on them or with threats to their well-being (Lazarus, 1966). Stress is a feeling of pressure and strain. Small amounts of stress may be beneficial, desired and even healthy. It plays a factor in adaptation, motivation and reaction to the environment. However, excessive amounts of stress may lead to increase the risk of heart attacks, strokes, ulcers and mental disorders such as depression (Sapolsky, 1994).

Selye (1975) proposed that there are four variations of stress. On one axis, there is bad stress (distress) and good stress (eustress). On the other axis is under-stress (hypostress) and over-stress (hyperstress). The goal would be to balance hyperstress and hypostress and gain as

much eustress as possible (Cooper, 1983). It is extremely useful for a productive lifestyle because it makes working enjoyable instead of a chore, as seen with distress.

Stress is a non-specific response to stressors (Cooper, 1983). On the other hand, stressors are considered as neutral meaning that the same stressor can cause either distress or eustress. What varies is how individual perceive the situation and the degree of response. It is individual differences and responses that will determine a stressor to cause distress or eustress (Hargrove *et al.*, 2013).

The response to stress is variable and there are individual differences both behaviourally and physiologically in how a person perceives a challenge. Individual differences in responding to challenge are a product of developmental influences, experience and genetics. Genetic predisposition is an important factor, yet genetics alone does not explain individual differences.

Stress may be classified as being either acute or chronic (Carayon, 1995). Acute stressors are 'extreme and unusual external stimuli that are perceived as threatening' (Anshel, 2000). They have a specific time of onset, short of duration and are unlikely to recur (Barling, 1990). Conversely, chronic stressors are characterized by 'their continuing problematic nature and extended duration' (Gottlieb, 1997) and their high likelihood of recurrence (Barling, 1990). They are long-term stressors that people experience daily (Carayon, 1995). Acute stressors may be similar to traumatic stressors, which are defined as significant catastrophes or traumatic events that have a sudden onset, temporary in nature and tend to create negative emotional consequences (Carayon, 1995; Evans and Coman, 1993; Kirtland *et al.*, 1991).

Strain may result from particularly traumatic or catastrophic events that involve an unexpected onset. Such events are identifiable and very specific in nature and may cause immediate distress (Eden, 1987; Newton, 1989). Acute stressors at work can include extreme experiences, such as exposure to dangerous environment (Anshel, 2000; Anshel *et al.*, 1997; Kleber and van der Velden, 2009), natural disasters (Kleber and van der Velden, 2009) and job transfer or loss (Anshel *et al.*, 1997; Frone and McFarlin, 1989).

Signs of stress may be cognitive, emotional, physical, or behavioral:

Cognitive symptoms:

- Memory problems
- Inability to concentrate
- Poor judgment
- Pessimistic approach or thoughts
- Anxious or racing thoughts
- Constant worrying

Emotional symptoms:

- Moodiness
- Irritability or short temper
- Agitation, inability to relax
- Feeling overwhelmed
- Sense of loneliness and isolation
- Depression or general unhappiness

Physical symptoms:

- Aches and pains
- Diarrhea or constipation
- Nausea, dizziness
- Chest pain, rapid heartbeat
- Loss of sex drive
- Irregular periods

Behavioral symptoms:

- Eating more or less
- Sleeping too much or too little
- Isolating oneself from others
- Procrastinating or neglecting responsibilities
- Using alcohol, cigarettes, or drugs to relax
- Nervous habits

2.3.2 Stress among Emergency Department Personnel

Stress at work is an increasingly common feature of modern life. Occupational stress can be defined as the potentially harmful physical and emotional responses that occur when job requirements do not match the capabilities, resources or needs of the worker (Sauter *et al.*, 1990). While stressful events or stressors at the workplace can thus elicit stress reactions, stress is currently seen as the result of an interaction between characteristics and behaviour of the employee and his or her occupational environment (Hart and Cooper, 2001).

Occupational stress can ultimately lead to a variety of health-related problems that may also have important consequences for the organization. A survey in the United States on 28,000 workers from 215 organizations have linked workplace stress to poor performance, employee burnout, acute and chronic health problems (Ivancevich *et al.*, 1990; Kohler and Kamp, 1992). In the UK, research estimated that 360 million working days are lost through sickness each year at an estimated cost of £8 billion (Sigman, 1992). The UK Health and Safety Executive have estimated that at least half of these lost days are related to workplace stress (Cooper, 1983).

Occupational stress can result from various factors that interact with the worker to disrupt physiological or psychological balance and decision-making. Whilst occupational stress exists in all professions, health care workers appear to be at particular risk because they face demands that those in other occupations do not (Quine, 1998).

Stress is regarded as an inevitable part of working life in the health care workers (Quine, 1998) and studies have shown that health care workers experience poorer mental

health, have more sick leave and suffers higher levels of stress than the rest of the working population (Beeston and Jesson, 1999; Bourbonnais and Mondor, 2001). Health care workers are faced with high workload and have important responsibilities including potentially disastrous effects of errors (McVicar, 2003). They are also always exposed to stressful conditions such as exposed to infectious disease, physical injury and contact with human pain, suffering and death (Wheeler, 1998).

The ED environment is frequently characterised by worry and uncertainty (Hoag-Apel, 1998) as it is the front line of the hospital services and patients present to the ED in variable and unpredictable conditions. Personnel are constantly involved in rapid cognitive processes while making critical clinical decisions (Johnson and Rea, 2009; Yang *et al.*, 2001). Challenges faced by ED personnel include unpredictable workload, high patient attendance, limited resources, mass casualty incidents and potentially violent situations (Burbeck *et al.*, 2002; Escribà-Agüir *et al.*, 2006). In addition, they are also faced with personnel shortage, inadequate social support and lack of free time (McFarlane *et al.*, 2004). ED personnel must cope with acute or chronic stressors, frequently on a daily basis (Josland *et al.*, 2008).

Besides from the working nature in the ED, demographic factors also may play a role in the prevalence of stress among personnel. Occupational stress might be correlated to many individual characteristics (Beehr and Newman, 1978). Among others is the age of personnel. A study involving 510 female emergency nurses from 16 Chinese hospitals reported that age was significantly associated with occupational stress (Wu *et al.*, 2011). Stress scores were noted to be inversely related to age and recorded highest in nurses less than 30 years old. Role overload, role boundary and role insufficiency were found to affect the stress prevalence in the study (Wu *et al.*, 2011).