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Introduction

The GHQ is among the most thoroughly tested of all health measures [1]. It is a self-administered screening instrument designed to detect current diagnosable mental disturbances and disorders. It is used in surveys or in clinical settings to identify potential cases, leaving the task of diagnosing actual disorder to a psychiatric interview [1]. It is also widely used internationally and locally to measure mental health status especially in detection of emotional disturbances such as distress [2-8]. Ever since Goldberg introduced the GHQ in 1978, it has been translated into 38 different languages, testimony to validity and reliability of the questionnaire [5]. Reliability coefficients of the questionnaire ranged from 0.78 to 0.95 in various studies [5]. Goldberg et al. [4] reported that the average area under the ROC curve was 0.88, range from 0.83 to 0.95, which reflect its validity.

It has four versions based on the number of items; GHQ-60, GHQ-30, GHQ-28 and the shortest version GHQ-12. Each item is scored by four responses, typically being 'not at all', 'no more than usual', 'rather more than usual' and 'much more than usual'. There are two recommended methods for scoring the GHQ. The first scoring method ranges from 0 to 3 respectively: with the least symptomatic answer scores 0 and the most symptomatic answer scores 3. The second scoring method, also known as binary method, ranges from 0 to 1: with the two least symptomatic answers score 0 and the two most symptomatic answers score 1. Using the binary scoring methods the 28- and 30-item versions classify any score exceeding the threshold of 4 as achieving 'caseness'. The caseness threshold is 3 for the 12-item version.

The shortened version work was found to be as reliable as the long version in detecting distress [4]. The GHQ-30 and GHQ-12 were commonly used as its validity is well-established internationally [9, 10] and locally [2, 3]. It was also commonly used in student samples [10] and young populations in the community [9]. Furthermore it is simple, easy to understand, short and straightforward to complete. Many studies were done in the western countries [8] and two studies were done in Malaysia [2, 3]. However, in general it is hardly found such study in medical student population.

Validity generally is defined as to what extent the measurement measures what it should measure, whereas reliability generally is defined as consistency or reproducibility of measurement over time or occasions [11-13]. Sensitivity is defined as the proportion of persons with disease who test positive, whereas, specificity is defined as the proportion of persons without disease who test negative [12-14]. Therefore sensitivity and specificity describe how well the test predicts and discriminates between patients with and without disease. The accuracy of a test depends on how well the test separates the group being tested into those with and without the disease in question. Accuracy is measured by the area under ROC curve [14]. While the Cronbach's alpha value is used to determine the internal consistency (reliability) of an instrument.

The purpose of this study is to compare the sensitivity, specificity and reliability of the Malay version GHQ-30 and the Malay version GHQ-12 in detecting distressed medical student. It is also looking at the degree of agreement both GHQs in detecting distressed medical students at the optimum cut-off point score.

Methods

The Malay version GHQ-30 and GHQ-12

The Malay version of GHQ-30 and GHQ-12 was used in this study. In Malaysia, the instrument has been validated in the local population using Malay versions [3, 15]. The items of the Malay version GHQ-30 and GHQ-12 were rated under 4 categories of responses; *tiada langsung* (not at all), *tidak lebih dari biasa* (no more than usual), *lebih dari biasa* (more than usual), *sangat lebih dari biasa* (much more than usual) for certain statements and for certain statements the responses were *lebih dari biasa* (more than usual), *tidak lebih dari biasa* (no more than usual), *kurang dari biasa* (less than usual) and *sangat kurang dari biasa* (much less than usual). The binary scoring method, as mentioned previously, was used in this study.

The Malay version Beck's Depression Inventory II (BDI-II)

BDI-II is the most recent version of the Beck Depression Inventory [16]. It was first introduced in 1996 and is relatively new to the psychological assessment literature. It is one of the most widely used measures of depressive symptoms both in adolescents and in adults [17]. The instrument is an upgraded version of the original Beck's Depression Inventory (BDI) in order to make its symptoms content more reflective of the diagnostic criteria that are described by the American Psychiatric Association [18]. Although the instrument was initially developed to measure intensity or severity of the depressive symptomatology in patients with psychiatric disorders [19], it has now been widely used as a screening instrument to detect emotional disorder such as distress and depression both in clinical practice and in research projects [20].

It is a self-reporting questionnaire and it consists of broad symptoms of psychiatric disorders in the general population. It was translated and validated in Malay language among general population in Malaysia [17]. It comprises of 21 items and was rated using a 4-point scale ranging from 0 to 3. The minimum and maximum scores were 0 and 63 respectively. Those who score equal to or more than 9 were considered as experiencing significant emotional disturbances (distress) [17]. Similar scoring method was used in this study.

Validation study

Medical students in the School of Medical Sciences, Universiti Sains Malaysia were selected as the study population. Proper instructions were given before the administration of the instruments. The subjects were asked to respond to all the statements and no time limit was imposed. During the time of administration the investigator gave proper assistance and directions whenever needed.

Sample size

Sample size was calculated based on the recommended ratio of 5 subjects per item (21). The total sample size after 20 percent dropout rate consideration was 187 subjects. Convenient sampling method was applied; 70 second year medical students and 117 fifth year medical students were asked to participate in this study.

Collection of data

A total of 187 medical students were identified from second year and fifth year to fill in the three questionnaires; the GHQ-12, GHQ-30 and BDI-II. The study was conducted on voluntarily basis with informed consent prior to administration.

Data was collected by guided self-administered questionnaire. The time taken by the students to fill in the questionnaire was around 15 to 25 minutes. The questionnaires were collected on the same day. The investigator obtained permission and clearance from the Human Ethical Committee, Universiti Sains Malaysia.

Reliability analysis

Reliability analysis was done using SPSS version 12 to determine the internal consistency of the items measured by using Cronbach's alpha coefficient. The items of GHQ-30 and GHQ-12 were considered to represent a measure of high internal consistency if the Cronbach's alpha value was more than 0.7 [11].

Sensitivity and specificity analysis

Distress was determined based on the Malay version BDI-II. The BDI-II score equal to and more than 9 was considered as significant distress [17]. The Receiver Operating Characteristics (ROC) curve analysis was done using SPSS version 12 to determine the sensitivity, specificity, and area under ROC curve of both GHQs. The sensitivity, specificity and area under ROC curve value more than 0.70 was considered as having an acceptable predictive and discriminative value [14]. The negative and positive predictive values were calculated manually by Microsoft Excel software.

Degree of agreement between the GHQ-12 and GHQ-30

The Cohen's Kappa (often simply called Kappa) is used as a measure of agreement between two instruments. The degree of agreement between GHQ-12 and GHQ-30 was considered as having a good level of agreement if Kappa value more than 0.6 [22].

Results

A total of 141 (75.4%) medical students participated in this study. They were 49 (34.8%) second year medical students and 92 (65.2%) fifth year medical students. 99 (70.2%) were female students. 86 (61.0%) were Malay, 53 (37.6%) were Chinese, 2 (1.4%) were Indian and 3 (0.3%) were others. 86 (61.0%) were Muslim, 37 (26.2%) were Buddha, 15 (10.6%) were Christian, and 9 (2.1%) were others.

Reliability analysis

The Cronbach's alpha value for the Malay version GHQ-30 and GHQ-12 were 0.93 and 0.85 respectively. It suggested that both the GHQ-30 and GHQ-12 were equally reliable instruments as both of them having high internal consistency.

Sensitivity and specificity analysis

Table 1: The area under ROC curve, sensitivity, specificity, positive and negative predictive values of the GHQ-30 and the GHQ-12 at optimum cut-off point for significant distress (detection based on BDI-II).

Inventory	Score*	The Area Under ROC curve	Sensitivity %	Specificity %	PPV %	NPV %
GHQ-30	5/6	0.93	87.5	80.6	70.0	92.6
GHQ-12	3/4	0.82	81.3	75.3	62.9	88.6

ROC = Receiver Operating Characteristics, PPV = Positive Predictive Value, NPV = Negative Predictive Value

*Optimum cut-off point

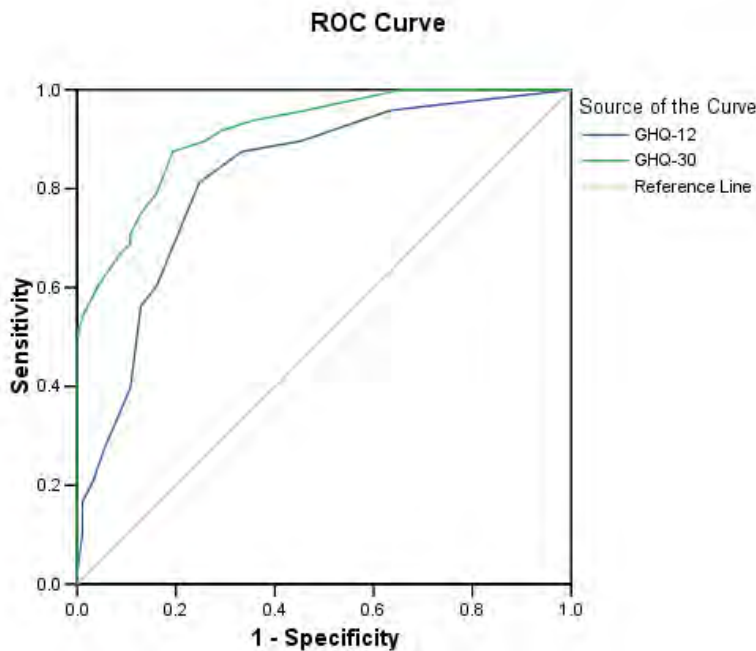


Figure1: The area under ROC curve of the GHQ-30 and GHQ-12 score at cut-off points of 5/6 and 3/4 respectively for significant distress (diagnoses were based on the BDI-II).

Table 1 and figure 1 shows the GHQ-30 score at 5/6 have the optimum sensitivity and specificity which were 87.5% and 80.6% respectively with PPV of 70% as well as having the area under ROC curve more

than 0.7. It also shows the GHQ-12 score at 3/4 have the optimum sensitivity and specificity which were 81.3% and 75.3% respectively with PPV of 62.9% as well as having the area under ROC curve more than

0.7. These findings were evidences to suggest that both the GHQ-30 and GHQ-12 has equally an acceptable predictive and discriminative value in detecting distressed medical students.

Degree of agreement between the GHQ-12 and GHQ-30

The Kappa value for the GHQ-12 and GHQ-30 was 0.65 ($p < 0.001$) and it reflected a good level of agreement [22].

Discussion

Reliability analysis suggested that the GHQ-12 and GHQ-30 had high internal consistency as their Cronbach's alpha values were 0.85 and 0.93 respectively; it reflected the consistency and reproducibility of the two GHQ measurements. The findings were also evidence to support both GHQs were reliable instruments that could be used in the future to detect distressed medical students. The analysis also found that the short version seems to work as reliable as the longer version. This finding is similar with other findings done elsewhere [1, 4]. It is noteworthy that, if investigators wish to use a screening tool as a case detector, the short version GHQ is recommended since it is remarkably reliable and works as well as the longer version [4].

ROC curve analysis showed that the optimum cut-off point to detect distress for GHQ-12 and GHQ-30 were 4 and 6 respectively as shown in table 1; it means that any score equal to or more than the cut-off points are considered as 'caseness'. The analysis also showed that the GHQ-30 score of 6 yielded predictive and discriminative abilities as the sensitivity, specificity and area under ROC curve values were more than 0.7 (which were 0.87, 0.81, and 0.93 respectively). It also showed that the GHQ-

12 score of 4 yielded acceptable predictive and discriminative abilities as the sensitivity, specificity and area under ROC curve values were more than 0.7 (which were 0.81, 0.75 and 0.82 respectively). The findings reflect the ability of the two GHQs to discriminate between distressed and non-distressed medical students. It is noteworthy to highlight that, present study finding is comparable with the other findings which GHQ-12 yielded sensitivity and specificity about 76.3% and 83.4% respectively with threshold score ranged from 2 to 4 [4] and the GHQ-30 yielded the sensitivity and specificity were 91.4% and 87.0% respectively with threshold score at 5 [1]. The findings were evidence to support the validity of the GHQ-30 and GHQ-12 in detecting distressed medical students. This study also found that the GHQ-30 has better discriminative ability compared to the GHQ-12. It is worth to highlight that, discriminative ability of the GHQ-12 was remarkably good as its area under ROC curve value was more than 0.8 [14], therefore investigators are recommended to use short version rather than long version as it can accelerate research process.

This study found that the GHQ-12 and GHQ-30 had a good level of agreement in detecting distressed medical students as the Kappa value was more than 0.6 [22]. This is another finding to support that both GHQs measured what it should measure. It also supported that the short version works as well as the long version. Therefore, investigators are recommended to use the short version as it can improve research response rate [4].

Conclusion

This study showed the Malay GHQ-30 had better ability to discriminate between distressed and non-distressed medical

students compared to the Malay GHQ-12. The shorter version was found to be as reliable as the long version GHQ-30 in detecting distressed medical students. The optimum threshold score for the GHQ-30 and GHQ-12 to detect distressed medical students were 6 and 4 respectively. The GHQ-12 and GHQ-30 showed a good level of agreement in detecting distressed medical students.

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Introduction

Stress is generally defined as the body's nonspecific response or reaction to demands made on it, or to disturbing events in the environment [1-2]. It is a process by which we perceive and cope with environmental threats and challenges [3]. Personal and environmental events that cause stress are known as stressors [4]. Therefore, stress is simply defined as emotional disturbances or changes caused by stressors. Stress which promotes and facilitates learning is called good stress. An optimal level of stress can enhance learning ability [5]. On the other hand, stress which inhibits and suppresses learning is called bad stress. The bad stress must be prevented and avoided [6]. It is noteworthy that the same stressors may be perceived differently by different students, depending on their cultural background, personality traits, experience and coping skills [8].

The milieu of secondary education has always been regarded as a stressful environment to students. 20 percent of children around the world were estimated by World Health Organization to have mental health problems [9]. Many studies have revealed a negative association of stress with mental, emotional and physical morbidity [10-19]. Chronic and excessive stress leads to physical, emotional and mental health problems [20], reduced self-esteem [5, 21] and affects students academic achievement, personal and professional development [19].

It is noteworthy that over exposure stress causes physical, emotional and mental health problems [20]. Therefore, early

detection and intervention may prevent and minimize the exert effects of stress on the students in the future [10, 12, 13, 17]. Stress on secondary school students needs to be recognized, and strategies developed to improve it should be focused on both individual and situational factors [22]. Park & Adler [23] reported that effective and appropriate coping strategies may buffer the impact of newly encountered stressful situations on mental and physical health. Therefore, using coping strategies effectively and appropriately will help the students in improving their stress level.

According to Folkman & Lazarus [24, 25], coping strategies can be grouped into two general types; problem-focused and emotion-focused coping. Problem-focused coping is aimed at problem solving or doing something to alter the source of stress. Emotion-focused coping is aimed at reducing or managing the emotional distress that is associated with the situation. Although most stressors elicit both types of coping, problem-focused coping tends to predominate when people feel that something constructive can be done, whereas emotion-focused coping tends to predominate when people feel that the stressor is something that must be endured [24, 25]. Carver et al. [26] and Carver [27] have proposed 16 dimensions of coping: five dimensions assess conceptually distinct aspects of problem-focused coping [active coping, planning, suppression of competing activities, restraint coping, seeking of instrumental social support]; five dimensions assess aspects of what might be viewed as emotion-focused coping (seeking

of emotional social support, positive reinterpretation, acceptance, denial, turning to religion); and six dimensions assess coping responses that are less useful (focus on and venting of emotions (venting), behavioral disengagement, mental disengagement (self-distraction), humor, substance use, self-blame). These coping strategies if used effectively may buffer the unwanted impacts of stressful situation on physical, emotional and mental wellbeing (23).

In the process of growing up, all children experience stress. These experiences are potentially valuable in that they may foster the development of effective coping strategies, and thus enhance overall psychological development. Band and Weisz [28] reported that children as young as 6 years old are aware of stress in their lives. Although they are exposed to significant levels of stress, children may lack both the necessary experience and maturity to understand stress and the intellectual and emotional resources to cope effectively with it [29]. Some investigators have suggested that the presence of stress can be used productively to build higher levels of future immunity to anxiety [30]. D'Aurora and Fimian [31] argued that limited and manageable levels of stress provide challenges and an enthusiasm for living.

Schultz [32] has suggested that youthful stress evolves out of child-perceived threats to his or her self-esteem, security, safety, or way of life. These environmental demands or disturbing events may be physiological, physical, or psychological [33], or a

combination of these. Khalid [34] has reported that over one-third (35.5%) of adolescents had stress. Many of these emotional disturbances seem to be caused by school-related stress such as inappropriate workloads or assignments, examinations, falling behind others and inappropriate treatment by teacher [35, 36].

The purpose of this initial study is to gather baseline data on the stress prevalence, stressors, and coping strategies among secondary school students in a government secondary school hence it provides valuable information for future study in such area as well as it will also help secondary school teachers and students to understand better about this common problem.

Methods

This was a preliminary cross-sectional study involving 100 secondary school students from a Malaysian government secondary school located in Kota Bharu, Kelantan. Convenient sampling method was used in selecting school and participants to participate in this study.

Investigator requested the students to fill in the questionnaire during face-to-face session. Completion of the questionnaire was voluntary. Data was collected by guided self-administered questionnaire. The time taken by the students for filling in the questionnaire was around 15 minutes. The questionnaires were collected on the same day.

The questionnaire comprises of two parts; the first collects sociodemographic data and the second consisted of items from the

GHQ-12, SSSM, and Malay Brief COPE. In the first part, variables pertaining to demographic profile of the subjects were collected including information on gender, race and religion.

One of the most widely used measurement tool to measure stress levels is the 12-item General Health Questionnaire (GHQ-12) [37]. Reliability coefficients of the questionnaire have ranged from 0.78 to 0.95 in various studies. The items of GHQ-12 represent 12 manifestations of stress and respondents were asked to rate the presence of each of the manifestations in themselves during recent weeks. This is done by choosing from four responses, typically being 'not at all', 'no more than usual', 'rather more than usual' and 'much more than usual'. The scoring method is a binary scoring method where the two least symptomatic answers score 0 and the two most symptomatic answers score 1 – i.e. 0-0-1-1. The sensitivity and specificity of the GHQ-12 score at cut-off point of 4 were 81.3% and 75.3% respectively with positive predictive value of 62.9% and therefore, caseness (distress) was considered as a score of 4 or more [38 - 40].

The SSSM is a newly developed instrument to identify stressors of secondary school students. The items in SSSM represent 44 possible sources of stress in secondary school students identified from the literature. It is in Malay language and a self-reporting questionnaire. Respondents were asked to rate each source by choosing from five responses, 'causing no stress at all', 'causing mild stress', 'causing moderate stress', 'causing high stress' and 'causing severe

stress'. The scoring method assigns marks from 0 to 4 to each of the responses respectively.

The Malay Brief COPE is a translated version from the validated original Brief COPE and is used to identify ways in managing stress [26, 27, 41]. This inventory consists of 28 items describing coping methods and they are rated under 4 categories of responses; *saya tidak melakukan ini langsung* (I haven't been doing this at all), *saya melakukan ini kadang-kala sahaja* (I have been doing this for a little bit), *saya agak kerap melakukan ini* (I have been doing this a medium amount), *saya sangat kerap melakukan ini* (I have been doing this a lot) to indicate how frequent they have been doing what the items describe. There are 14 domains: behavioral and mental disengagement, active coping, seeking of instrumental support, seeking of mental support, focus, positive interpretations, planning, humor, acceptance, turning to religion, denial, substance abuse, suppression of competing activities and self blame.

Informed consent was obtained from the participants. Permission was obtained from the school and Universiti Sains Malaysia Ethical Committee prior to the start of the study.

Data were analysed using Statistical Package for Social Sciences (SPSS) version 12. All data collection forms were given serial numbers. Data were entered, checked for data entry errors, explored and cleaned. The researcher used alpha (α) at 0.05 and confidence interval of 95%. Descriptive

statistics was applied for analysis of the demographic data, the students' stress prevalence based on GHQ-12 score, the stressors, and the coping strategies. Reliability analysis was applied to test the internal consistency of the Malay GHQ-12, the SSSM and the Malay Brief COPE in identifying stressors and coping strategies among secondary school students. Items of an instrument were considered to represent a measure of high internal consistency if the total Cronbach's alpha value was more than 0.7 [42].

Results

A total of 90 (90%) students responded to the questionnaire. 50 (55.6%) were female students. All of them were at age of 16 year-old, Malay and Muslim.

Reliability analysis shows that the Cronbach's alpha value for the Malay GHQ-12, the SSSM and the Malay Brief COPE were 0.61, 0.83 and 0.91 respectively. The analysis shows the instruments were reliable instruments in identifying stress status, stressors and coping strategies among secondary school students.

This present study found that the percentage of distressed secondary students was 26.1% as shown in figure 1.

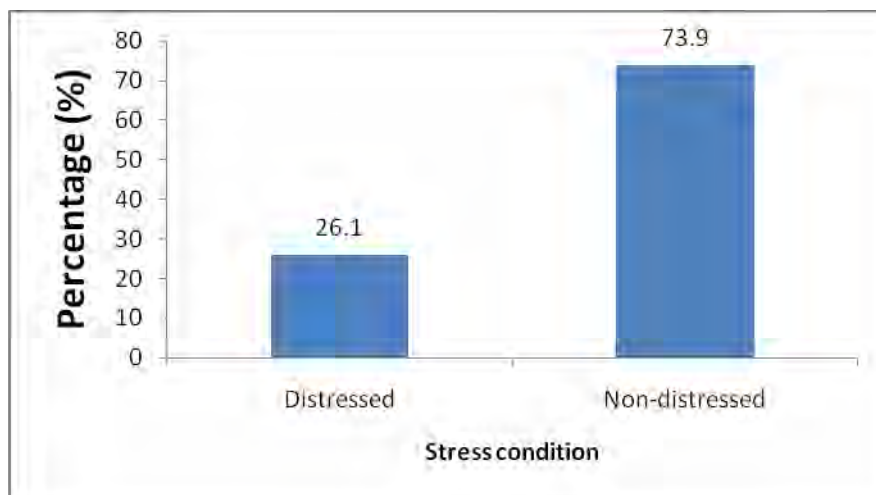


Figure 1: Prevalence of distress among secondary school students.

Table 1: Stressors (identified by the SSSM) ranked by mean degree of stress caused as perceived by secondary school students.

Rank	Items	*Degree of stress Mean [SD]
1	<i>Kemungkinan gagal melanjutkan pelajaran ke universiti</i> [Afraid of the possibility not getting place in any university]	3.02 [1.11]
2	<i>Mendapat markah yang rendah</i> [Getting poor marks]	2.57 [1.01]
3	<i>Kekurangan masa untuk membuat ulangkaji</i> [Lack of time to do revision]	2.43 [1.01]
4	<i>Peperiksaan</i> [Examination]	2.36 [1.14]
5	<i>Sukar untuk memahami matapelajaran</i> [Difficulties in understanding content that have been learnt]	2.33 [1.07]
6	<i>Terlalu banyak perkara yang perlu dipelajari</i> [Too many content to be learnt]	2.24 [1.00]
7	<i>Ujian yang terlalu banyak/kerap</i> [Tests are too frequent]	2.22 [1.19]
8	<i>Keadaan pembelajaran yang penuh persaingan</i> [Competitive learning environment]	2.06 [1.06]
9	<i>Tugasan yang diberikan oleh guru terlalu banyak</i> [Too many assignments given by teachers]	2.06 [1.09]
10	<i>Jadual waktu pembelajaran yang terlalu padat</i> [Learning schedule are too packed]	2.01 [1.10]
11	<i>Tidak dapat menjawab soalan yang diberikan oleh guru</i> [Unable to answer questions from teachers]	2.01 [0.98]

12	<i>Merasakan diri serba kekurangan</i> [Feeling of incompetence]	1.97 [1.10]
13	<i>Harapan terhadap diri sendiri untuk lakukan yang terbaik</i> [High self-expectation]	1.92 [1.22]
14	<i>Ketinggalan dalam mengikuti jadual ulangkaji</i> [Getting behind revision schedule]	1.81 [0.96]
15	<i>Penglibatan di dalam pembentangan kelas</i> [Participation in class presentation]	1.43 [0.98]
16	<i>Harapan orang lain untuk lakukan yang terbaik</i> [High expectation imposed by others]	1.83 [1.11]
17	<i>Sistem permarkahan ujian/peperiksaan yang tidak telus</i> [unfair assessment grading systems]	1.82 [1.21]
18	<i>Kurang motivasi untuk belajar</i> [Lack of motivation to learn]	1.71 [1.08]
19	<i>Guru kurang kemahiran mengajar</i> [Teachers lack of teaching skills]	1.66 [1.13]
20	<i>Seri diganggu oleh orang lain ketika sedang belajar</i> [Interruptions by others during learning]	1.66 [1.23]
21	<i>Kurang bahan-bahan bacaan</i> [Insufficient reading material]	1.59 [1.08]
22	<i>Perselisihan faham dengan rakan-rakan sekolah</i> [Conflict with peers]	1.59 [1.00]
23	<i>Berfikiran negatif terhadap diri sendiri</i> [Negative thinking toward own-self]	1.54 [1.24]
24	<i>Tidak jelas dengan apa yang diharapkan daripada saya</i> [Uncertainty of what are expected from me]	1.52 [1.06]

25	<i>Kerja-kerja yang telah disiapkan jarang dihargai</i> [Lack of recognition to work done]	1.51 [1.15]
26	<i>Belajar demi memperbaiki nasib keluarga</i> [Studying for the sake of family]	1.43 [1.48]
27	<i>Perselisihan faham dengan keluarga</i> [Conflict with family]	1.41 [1.31]
28	<i>Perselisihan faham dengan guru</i> [Conflict with teachers]	1.42 [1.43]
29	<i>Kehendak keluarga untuk berhenti sekolah</i> [Family desire to stop schooling]	1.39 [1.61]
30	<i>Kurang mendapat maklumbalas daripada guru</i> [Lack of feedback from teachers]	1.37 [1.09]
31	<i>Memberi jawapan yang salah di dalam kelas</i> [Giving wrong answer in the class]	1.36 [0.94]
32	<i>Penderaan secara verbal atau fizikal oleh guru</i> [Verbal or physical abuse done by teachers]	1.34 [1.32]
33	<i>Tugasan yang diberikan oleh guru tidak bersesuaian</i> [Inappropriate assignments given by teachers]	1.32 [1.09]
34	<i>Kurang mendapat bimbingan daripada guru</i> [Lack of guidance and supervision from teachers]	1.31 [1.13]
35	<i>Kurang masa bersama keluarga dan rakan-rakan</i> [Lack of free time with family and friends]	1.26 [0.91]
36	<i>Penderaan secara verbal atau fizikal oleh rakan</i> [Verbal or physical abuse done by peers]	1.26 [1.29]
37	<i>Penderaan secara verbal atau fizikal oleh keluarga</i> [Verbal or physical abuse done by family]	1.25 [1.25]

38	<i>Datang lewat ke sekolah</i> [Came late to the school]	1.24 [1.11]
39	<i>Keadaan kelas yang terlalu padat</i> [Crowded classroom]	1.12 [1.16]
40	<i>Penglibatan di dalam perbincangan secara berkumpulan</i> [Participation in group discussions]	1.11 [0.98]
41	<i>Menjawab soalan yang diberikan oleh rakan-rakan</i> [Answering friends' questions]	0.99 [0.87]
42	<i>Berbual dengan rakan-rakan tentang masalah peribadi</i> [Talking personal problems with peers]	0.87 [0.93]
43	<i>Kehendak diri untuk berhenti sekolah</i> [Unwillingness to go to school]	0.79 [1.29]
44	<i>Kehendak keluarga untuk meneruskan persekolahan</i> [Family desire to continue schooling]	0.56 [0.99]

* Degree of stress classification: 0 - 1.00 is 'causing nil to mild stress', 1.01 – 2.00 is 'causing mild to moderate stress', 2.01 – 3.00 is 'causing moderate to high stress' and 3.01 – 4.00 is 'causing high to severe stress'.

Table 1 showed the top ten rank of stressor were afraid of not getting place in tertiary education, examinations, too much content to be learnt, difficulty in understanding subject that have been learnt, too much homework, and school timetable was too

packed. All of the stressors were related to the academic matters. However, the main stressor that was very concerned by the students is their worry about unable to get place to further their study in tertiary education.

Table 2: Rank of coping strategies according to mean score as rated by medical students

Rank	Coping Strategy	N	*Mean	Std. Deviation
1	Religion	90	6.54	1.39
2	Active coping	90	5.53	1.27
3	Positive reinterpretation	90	5.53	1.49
4	Planning	90	5.50	1.33
5	Use of instrument support	90	5.24	1.53
6	Self-distraction	90	4.93	1.46
7	Acceptance	90	4.78	1.30
8	Venting of emotion	90	4.71	1.43
9	Self-blame	90	4.54	1.76
10	Use of emotional support	90	4.52	1.33
11	Denial	90	3.67	1.31
12	Behavioral disengagement	90	3.41	1.45
13	Humour	90	3.30	1.26
14	Substance abuse	90	2.00	0.00

* Minimum score was 2 and maximum score was 8. Mean score interpretations were as below: 2.00 = haven't been doing this at all, 2.01 to 4.00 = have been doing this a little bit, 4.01 to 6.00 = have been doing this a medium amount, 6.01 to 8.00 = have been doing this a lot.

Table 2 showed that the top five coping strategies that frequently used by the students were religion, active coping, positive reinterpretation, planning, and use of instrumental support. However the main coping strategy was religion as it has score more than 6 which indicate it has been used a lot by the students.

Discussion

The prevalence of distressed secondary school students was 26.1% and it is relatively higher compared to the normal population which is less than 10% as mentioned by Firth [12]. The prevalence is also relatively higher compared to the WHO expected figures of mental health problems among adolescents population which was

about 20% as reported by Sidek [9]. It is interesting to mention that, this prevalence of distress (26.1%) is relatively similar compared to the prevalence of distressed first year medical students which was about 26.3% as reported by a previous study [43]. This alarming finding suggested a sense of growing pressure among the secondary school students. However, the result should be interpreted cautiously since the small sample size used in this study might not reflect the actual prevalence of stress in the population. Therefore, further study with appropriate sample size and better study design should be conducted in the future to confirm this finding. Perhaps, while gathering more data on this problem, active measure should be taken as soon as possible to minimize the potential exert impacts of distress on the students' wellbeing.

As expected, the top ten stressors (based on ratings by the students) were related to academic matters. The top ten stressors were feeling afraid of not getting place in tertiary education, examinations, too much content to be learnt, difficulty in understanding subject that have been learnt, too many homework, and school timetable was too packed. It is interesting to highlight that feeling afraid of not getting place in tertiary education was rated as causing high to severe stress, while the rest of the top ten stressors were rated as causing moderate to high stress. The academic matters as the major stressor were also reported by other studies [12, 15, 16, 29, 43-45] although the rank of the stressors within this category may be significantly different from studies done elsewhere [43, 44]. This fact suggests two more areas for further study: firstly the design of a curriculum which optimizes the balance between the 'push' factors (bringing out the best in students, maintaining standards, etc) and inducing undue and unproductive stress. The second area is the

focus of intervention programmes. The facts suggest that training students to have a healthy mindset with positive coping strategies will be beneficial [46-48].

Coping strategies is defined as how a person react or response toward a stressor [1-4]. Effective and appropriate coping strategies may minimize the impact of encountered stressful situations on one's wellbeing [23]. This study found that the top five coping strategies that frequently used by the students were religion, active coping, positive reinterpretation, planning, and use of instrumental support, however, the main coping strategy was religion. These strategies are positive coping strategies which have been reported in studies as very adaptive and hasten the recovery from distress [3, 26, 27]. It is noteworthy that, despite of positive coping strategies used by the students, the stress prevalence is still higher from the normal population. Perhaps, it will be interesting to explore on this matter further in the future studies.

It is noteworthy that, this study has its limitations which must be taken into consideration in the future studies. The sample size in this study was small and not representing the actual distribution of the study population in term of gender, ethnic groups, years of study, religion, parent education and income level. The convenient sampling method used in this study may lead to sample bias hence may affect accuracy of the results. Furthermore, the cut-off point of GHQ-12 used to identify distress was based on the other population threshold which might not reflect actual stress level of the students; either it could be higher or lower. Another limitation was validity of the instrument used to identify stressors, even though it was found to be reliable, still questionable; perhaps proper validation of the instrument should be done

in the future. Therefore, the present study results should be interpreted cautiously. However, this study has provided useful initial data on this area for future studies.

Conclusion

The prevalence of stress among secondary school students in a Malaysian government school was high. Academic related problems were the major stressor among the students. The most frequent coping strategies being used by the students were positive coping strategies.

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Introduction

Women are at a disproportionately high risk of physical, sexual and psychological violence from an intimate person [1]. Women exposed to domestic violence are vulnerable to developing numerous physical and mental health consequences, which incurred health care costs [2]. Several empirical studies have explored the relationship between experiencing domestic violence and developing posttraumatic stress disorder (PTSD). Among battered women, the estimated prevalence of PTSD ranged from 33% to 84% [3, 4, 5] depending on the population sampled, the method of assessment of PTSD and the time since the last domestic violence event. A study in Taiwan found strong relationship between domestic violence and PTSD in Asian setting where 93.6% of the 109 abused wives had high overall scores in post-traumatic responses [6]. Among abused women, PTSD symptoms can last long after the end of the abusive relationship [7].

Domestic violence is an alarmingly prevalent problem in Malaysia. Based on a national research study in Malaysia conducted by Women's Aid Organisation (WAO) between 1990 and 1992, it was estimated that in 1989, 1.8 million or 39% of women over the age 15 were beaten by their husbands or boyfriends [8]. In 2006, 1609 (49.3%) reports were made by Malay, 585 (17.9 %) by Chinese, 822 (25.2 %) by Indian and 248 (7.6%) by other race victims. Women Centre for Change (WCC) in 2007, received 34% (91 cases) of clients reported domestic violence [9].

Early research showed that 82.4% of the Malaysian women who experienced partner abuse and sought help from a shelter, met the criteria of PTSD on the PTSD Symptom

Scale-Self-Report (PSS-SR)[10] but this study failed to examine the relationship between the risk factors and the presence of PTSD symptoms and was also limited by the small number of women. Research by Soo [11] revealed that PTSD was present in 60% of the subjects and that non-productive coping style was as a significant predictor of PTSD [11]. However, these preliminary results might be an under-representation of the 'true' level and nature of domestic violence survivors in Malaysia. Despite increasing evidence of the role of the type of intensity of abuse and cognitive processes in predicting PTSD in victims of traumatic events, few works has examined the relationship between the type of intensity of abuse and negative appraisals with the presence of PTSD symptoms in survivors of domestic violence.

This study was conducted to examine the prevalence of PTSD among Malaysian women who experienced domestic violence and sought help at the shelters. This study also explored the association between the vulnerability factors such as the type of intensity of abuse, negative appraisals of oneself and one's world after experiencing domestic violence, coping styles and the level of social support with the presence of PTSD symptoms. It is hypothesized that women who experienced domestic violence are at risk of developing PTSD, and that there are significant correlations between the type of intensity of abuse, negative appraisals of the event, coping style and social support with PTSD.

Methods

Participant and Procedures

A total of 40 individuals participated in the study. They were recruited from two non-

government organisations (NGO's), namely Women Centre for Change (WCC) in Penang and Women's Aid Organisation (WAO) in Petaling Jaya from 2007-2008. The inclusion criteria include women who experienced domestic violence and who sought help or shelter at these two centers.

Research Design

This was a cross-sectional survey study using non-probability purposive sampling. Non-probability purposive sampling does not involve random selection but enable the researcher to reach a targeted sample. The study was conducted by administering five psychological tests to each survivor.

a. The Detailed Assessment of Posttraumatic Stress (DAPS)

The Detailed Assessment of Posttraumatic Stress (DAPS) is a 104-item test of trauma exposure and posttraumatic response, designed for use with individuals who have undergone a significant psychological stressor. The DAPS has four domains and evaluates a range of trauma-relevant parameters which include the symptoms of Posttraumatic Stress Disorder (PTSD) and Acute Stress Disorder (ASD) as defined by the DSM-IV-TR (2000). DAPS has 4 domain scales namely Validity Scales (with two scales Positive Bias and Negative Bias), Trauma Specification Scales (with 4 scales Relative Trauma Exposure, Onset of Exposure, Peritraumatic Distress, and Peritraumatic Dissociation), Posttraumatic Stress Scale (with 4 scales Reexperiencing, Avoidance, Hyperarousal, Posttraumatic Stress Total, Posttraumatic Impairment), and associated features scale (which include Trauma-Specific Dissociation, Substance, and Suicidality Scales). The reliability coefficients for the clinical scales ranged from 0.57 for Relative Trauma Exposure

(RTE) to 0.96 for Posttraumatic Stress Total (PTS-T) in the normative sample, with an average clinical scale α coefficient of 0.83. Alpha coefficients for two validity scales were 0.71 for Positive Bias (PB) and 0.52 for Negative Bias (NB) in the normative sample. For all DAPS clinical scales, T scores (Ts) at or above 65 are considered clinically significant. However, DAPS protocols with Ts \geq 65 on PB and Ts \geq 75 on NB are to be considered invalid [12].

b. The Measure of Wife Abuse (MWA)

The Measure of Wife Abuse (MWA) is a 60 item scale with 4 subscales designed to measure the frequency of physical, sexual, psychological and verbal abusive behaviours. Higher scores are indicative of greater intensity of abuse. The MWA has good internal consistency with $\alpha = .93$ for total scale; .81 for physical abuse; .83 for verbal abuse; .94 for psychological abuse and 0.73 for sexual abuse [13]. The MWA possesses good concurrent validity. Although the validity coefficients calculated for the MWA and the Conflict Tactic Scale (CTS) were moderate, two of the MWA scales, physical and verbal abuse, showed high concurrent validity ($p < .01$).

c. The Posttraumatic Cognition Inventory

The Posttraumatic Cognition Inventory (PTCI) is a 33-item scale which measures three factors: negative cognitions about the self; negative cognitions about the world; and self blame for the trauma. The Cronbach's alpha for the total score and the three factors in the standardised sample were reported as 0.97, 0.97, 0.88, and 0.86, respectively. Test-retest reliability for a 1-week interval ranged from .75 to .89 and for a 3-week interval ranged from .80 to .86 for the three subscales. Convergent validity with two other scales that measure trauma-related

cognitions appears promising, as does the ability of the PTCI to differentiate individuals with and without PTSD (sensitivity = .78, specificity=.93) [14].

d. The Coping Scale for Adults (CSA)

The Coping Scale for Adults (CSA) Short Form is a 20 item self reporting inventory which measures four coping styles: Dealing with the Problem, Non-Productive Coping, Optimism and Sharing. To determine the reliability of CSA, an item's correlation coefficient had to be 0.73 or higher, with a mean value of 0.84 [15]. A study among 226 police officers in Kuala Lumpur revealed the internal reliability range from 0.49 to 0.65 for CSA Short Form [16] Construct validity between CSA and Rosenberg Self-Esteem Scale showed that 14 out of 19 coping strategies displayed statistically significant associations with self-esteem [17].

e. The Provision of Social Relations (PSR)

The Provision of Social Relations (PSR) is a 15-item instrument designed to measure components of social support. The PSR has two dimensions; family support and friend support. The PSR has good internal consistency with α that range from 0.75 and 0.87. Reverse coding has been used and therefore, the higher scores reflect more social support [18].

Data Analysis

Data were analyzed using the Statistical Package for the Social Sciences version 15 (SPSS-15). Descriptive statistics were used in this study to describe the characteristics of the respondents. Simple Linear Regression, Independent T-test and Pearson Correlation test were used to perform differences and relationship between variables based on the research hypothesis.

Results

Demographic Characteristics

Table 1: Demographic Characteristics of Domestic Violence Survivors

Demographic Data	(N=40)	Percent	
Age	21-30 years old	13	32.5
	31-40 years old	20	50.0
	41 and above	7	17.5
Race	Malay	8	20.0
	Chinese	9	22.5
	Indian	22	55.0
	Others	1	2.5
Marital Status	Single	1	2.5
	Married	32	80.0
	Separated	4	10.0
	Divorced	3	7.5
Choice of marriage	Own Choice	32	80.0
	Family Choice	6	15.0
	Combination of family and own choice	2	5.0
Employment Status	Unemployed	25	62.5
	Full-time Employed	10	25.0
	Part-time Employed	5	12.5
Level of Education	PMR and below	12	30.0
	SPM and above	28	70.0
Number of Children	None	1	2.5
	1-3	24	60.0
	4-6	12	30.0
	7-9	3	7.5
Residence	Owned	1	2.5
	Rented	9	22.5
	Others	18	45.0

PTSD Diagnosis Based on DSM-IV-TR Criterion

Table 2 shows the frequency of PTSD symptoms among domestic violence survivors still troubled by their experiences. Overall, PTSD diagnosis based on DSM-IV-TR criterion showed that the PTSD was present in 60% of the subjects. All subjects

(100%) met the criterion A1 (experienced or witnessed or was confronted with at least one trauma) and E (onset of exposure is more than one month). Majority of the subjects (97.5%) met the criterion A2 (intense fear, helplessness, or horror) and 85% of the subjects have fulfilled the criterion B (persistent re-experienced of traumatic event), C (persistent avoidance of

stimuli associated with the trauma and numbing of general responsiveness) and D (persistent symptoms of increased arousal). And 62.5% met the criterion F (disturbance

causes clinically significant distress or impairment in social, occupational or other important areas of functioning).

Table 2: PTSD Diagnosis based on DSM-IV-TR Criterion

DSM-IV-TR Criterion for PTSD		n	Percent
A1	At least one trauma exposure	40	100.0
A2	Fear/Helplessness/Horror	39	97.5
B,C and D	RE & AV & AR	34	85.0
E	Onset of exposure more 1 month	40	100.0
F	At least one of item IMP	25	62.5
PTSD is likely to be present		24	60.0

Correlation between Types of Intensity of Abuse, Negative Appraisals of the Event, Coping Styles and Social Support with PTSD

Table 3: Correlations between type of intensity of abuse, negative appraisals of the event, coping style and social support with PTSD

Scale	PTSD	
MWA	Physical Abuse	0.17
	Sexual Abuse	- 0.06
	Psychological Abuse	- 0.09
	Verbal Abuse	0.24
	Total Intensity of Abuse	0.09
PTCI	Negative Cognitions about the self	0.56 **
	Negative Cognitions about the world	0.19
	Self Blame	0.39 *
	Total Negative Appraisal	0.49 **
CSA	Deal with the Problem	- 0.23
	Non-productive Coping	0.28
	Optimism	- 0.33 *
	Sharing	- 0.11
PSR	Family support	- 0.27
	Friends support	- 0.31
	Total Social Support	- 0.37 *

**p< 0.01; *p<0.05

Table 3 showed the associations between types of intensity of abuse, negative appraisals of the event, coping styles and social support with PTSD among subjects.

Correlation between negative appraisals with PTSD showed significant positive correlation with negative cognitions about the self (r = .56, p< 0.01), self-blame (r= .39,

p<0.05) and Total Score of negative appraisals ($r = .49$; $p < 0.01$), whereas the Optimism coping style ($r = -.33$, $p < 0.05$) and Total Social Support ($p < 0.05$) have significant negative correlation with PTSD.

The Influence of Types of Intensity of Abuse, Negative Appraisals, Coping Styles and Social Support on PTSD Symptoms

Simple linear regression analysis showed that sexual, psychological, verbal and the total intensity of abuse did not influence the symptoms of PTSD in women with domestic violence (Table 4). Regression analysis of negative appraisals showed significant

contribution of negative cognitions about the self on PTSD symptoms [$R^2 = 0.32$, $F(1,38)=17.667$, $p < 0.001$]; self-blame [$R^2 = 0.15$, $F(1,38) = 6.722$, $p < 0.05$]; and Total Negative Appraisal [$R^2 = 0.24$, $F(1,38)=11.719$, $p < 0.01$]. Linear regression analysis of coping styles in predicting PTSD showed that only optimism coping style has significant contribution [$R^2 = 0.11$, $F(1,38)= 4.499$, $p < 0.05$]. Family support and friend support did not significantly contribute to the symptoms of PTSD. However, the Total Score of Social Support showed significant contribution to the PTSD symptoms [$R^2 = 0.14$, $F(1,38)= 5.910$, $p < 0.05$]

Table 4: Coefficients for Regression Analysis of Types of Abuse, Negative Appraisal, Coping Styles and Social Support in predicting PTSD

Factor	R ²	F	B	SE β	Sig.
Negative Appraisal					
Negative Cognitions about the self	0.32	17.667	0.56	0.42	0.001**
Self Blame	0.15	6.722	0.39	0.46	0.013*
Total Negative Appraisals	0.24	11.719	0.49	0.44	0.001**
Coping Styles					
Optimism	0.11	4.499	- 0.33	0.48	0.041*
Social Support					
Total Social Support	0.14	5.910	- 0.37	0.47	0.02*

(**p< 0.01; *p<0.05)

Discussion

The aims of this study were to examine the prevalence of PTSD symptomatology among the women who experienced domestic violence and also to investigate the psychological influence in relation to PTSD symptoms among the domestic violence survivors. The psychological factors that were examined in the study can be divided into peri-trauma and post-trauma factors. The peri-trauma factor that was examined in this study is the type of intensity of abuse. The study also examined the role of post-

trauma coping style, negative appraisal and social support on the reactions to and recovery from trauma. Overall, the results revealed that 60% of the subjects met the criteria for PTSD. Types of intensity of abuse did not appear to be related with PTSD symptoms. Post-trauma factors such as negative cognitions about the self, self-blame and negative appraisals were significantly and positively correlated with PTSD. The optimism coping style and social support had significant negative correlation with PTSD. The findings also showed that there were significant contributions of the

negative cognitions about the self, self-blame, negative appraisals, optimism coping style and social support towards PTSD.

The first question in this study was whether Malaysian women who experienced domestic violence would develop symptoms of PTSD. The results suggested that women who experienced domestic violence have high tendency for developing PTSD. The prevalence rate of PTSD in this study was similar with the rate in the earlier preliminary study [11] and it was found that 60% of the subjects exhibited patterns of symptoms consistent with the diagnosis of PTSD. The present study found a range of traumatic symptoms and the most prominent of which were reexperience, avoidance, dissociative responses, and symptoms of increased arousal. The findings are also consistent with previous research examining PTSD in battered women [6, 19]. The study suggests that psychological problems faced by the women after domestic violence may be similar in many respects, despite cultural differences.

Relationship between Type of Intensity of Abuse, Negative Appraisals, Coping Styles and Social Support with the PTSD

Negative appraisals about self, self blame for the abusive incident, and total PTCI scores were found to have significant positive correlation with PTSD. Regression analysis revealed that negative appraisal contributed significantly (24%) towards the variance that predicts PTSD symptoms. The results were consistent with earlier studies [20, 21, 22]. These also confirmed the role of negative appraisals in predicting PTSD severity, as described in the cognitive model of PTSD proposed by Ehlers and Clark [23]. Ehlers and colleague assert that persistent PTSD occurs when people processed the

traumatic event in ways that created a sense of serious current threat.

How an individual interpreted or appraised the causes of traumatic event, the meaning and its consequences seemed to play an important role in PTSD. As a result of the abusive situation the person developed negative cognitions about herself, believing that she is incompetent, and blame herself as responsible for the abusive situations, or responding in a certain way to the experiences. The study found that the subjects' maladaptive appraisals about themselves and self blame for the abusive situations, rather than maladaptive appraisals about the world that contribute significantly to PTSD. Eventually, the feeling of inadequacy, and incompetence, and self-blame may produce strong emotions which may themselves exacerbate PTSD symptoms.

Such maladaptive appraisals about themselves and their capacity to respond to those abusive situations can generate strong emotions such as anxiety, anger, shame or guilt as well as arousal symptoms which may themselves exacerbate PTSD symptoms. As such, the way subjects interpret themselves and, possibly, their role in the abusive relationship and its aftermath is important in determining how they adapt to the abusive situations. As such, the study suggests that effective treatment will need to address these cognitive factors.

Optimism coping style showed significant negative correlation with PTSD. Linear regression analysis showed that optimism coping styles significantly influenced the occurrence of PTSD (11%). This indicates that the greater use of such coping strategies can help to reduce the risk of developing PTSD. Experiencing domestic violence often produce some unpleasant emotions.

With such emotions, the person is likely to engage in either functional or dysfunctional coping strategies to handle the abusive situation. Relating to this, the study found that the most commonly used coping strategies among the subjects were non-productive and optimism coping styles.

Optimism coping style is one of the positive coping methods [24]. By focusing on the positive beliefs on future outcomes may help to improve the situation in a way that does not harm the survivor further. This is because when subjects adopt optimistic approaches, she may normally have more generalised expectation of future positive outcome than negative outcomes. This may allow them to gain some sense of personal control over their problems which may have indirectly helps in adapting to their current situation. One possible reason for the findings is the presence of psychological growth in subjects who took optimistic approaches in dealing with their difficulties in abusive relationship. Some women are able to perceive the abusive situation as a time-limited and may be able to find some element of personal growth in it.

Optimistic individuals are more likely to redefine their situations in a positive light which may allow them to adapt to and grow from their situations of varying intensity. As such, optimists tend to experience life's difficulties with less stressful than do pessimists and they are also more likely to bounce back from life's difficulties and recover their strengths and spirit. When facing an unpredictable life threatening situation such as domestic violence, it seemed that optimism plays an important role in determining one's overall sense of personal control over the situation. Subjects who tend to use more optimism coping strategies while they were still in abusive relationships were more likely to come out

from abusive relationships with fewer negative impacts such as PTSD. They are likely to recover quickly from the event. However, there is no published study which has comprehensively examined the correlates between optimism coping styles with the presence of PTSD symptoms in survivors of domestic violence. As such, the study suggests further research in this area.

Another commonly used coping strategy among the subjects was the non-productive coping strategy. Instead of voicing their distress, they usually try to suppress information about their situation. Such coping patterns are similar to the avoidant coping strategies. This kind of coping normally prevents survivors from making progress in how they cope with trauma and its consequences. The greater use of such coping style was found positively associated with the greater degree of PTSD symptoms in female survivors of domestic violence [25]. The maladaptive control strategies may themselves exacerbate PTSD symptoms.

Social support was found to have significant negative correlation with PTSD. Regression analysis showed that social support significantly contributed to the PTSD symptoms (14%). The research literature has demonstrated that battered women living in shelters were more likely to experience impaired social support. Most subjects in this study reported that they received low support from their family members. The result is consistent with previous studies where the amount and quality of social support received by the subjects showed significant negative correlation with PTSD. These findings were consistent with the results obtained by Thompson et al. [26] and Perrin et al., [27]. They found that lower quality social support was associated with a significantly increased risk of developing PTSD. Most probably supportive people in

the survivor's life may help to assist with coping and it is possible that by using avoidance coping styles the survivors are more likely to isolate themselves from possible sources of support that may be able to assist in recovery. It is also possible that having ongoing problems such as PTSD avoidance and withdrawal, may lead to loss of support in the long run which eventually increases the survivors' distress. All these possible factors may lead to a vicious cycle of distress which may themselves exacerbate PTSD symptoms.

Previous research found significant relationships between types of intensity of abuse with PTSD symptoms. This is inconsistent with earlier findings by Basile et al. [28], Lipsky et al. [29] and Pico-Alfonso et al. [30].

Conclusion

The prevalence of PTSD among women who experienced domestic violence in this study was high. The most prominent posttraumatic symptoms reported were reexperience, avoidance, dissociative responses, and symptoms of increased arousal. Post-trauma risk factors seemed to play important role in determine on how they adapt to the abusive situations. In particular, the current findings demonstrate that the negative appraisals about themselves and self blame for the abusive situations strongly influenced subsequent stress reactions and negative appraisals about themselves appeared to be the strongest positive predictor of increase tendency of developing PTSD. The greater use of optimism coping style and the higher quality social support appeared to lead to a significantly reduced risk of developing PTSD. However, peri-trauma type of intensity of abuse did not indicate any significant value.

There are several implications based on the present findings. First, service providers including shelter staff need to be sensitive to the increased PTSD risk noted among help-seeking survivors of domestic violence. Service providers should be trained in how to screen for PTSD symptoms in their work involving women who experienced domestic violence to ensure referrals to appropriate support services can be made. This is very important as early and structured intervention can help to reduce the risk of developing prolonged PTSD and may also indirectly help to prevent the development of secondary morbidity. Women who experienced domestic violence should be educated to be aware of these symptoms and understood that it was part of the normal recovery process.

Secondly, given the cognitive deficits commonly found in the subjects, the current findings imply that effective treatment for PTSD will need to address cognitive processes. In particular, appraisal about themselves and self blame for the abusive relationship need to be targeted. Modification of these appraisals may help to improve the positive views about themselves and about the world which may reduce the risk of developing PTSD. Cognitive Behaviour Therapy (CBT) particularly is an appropriate treatment approach for PTSD among survivors' of domestic violence. Successful coping strategies such as optimism coping skills will be able to keep the survivors of domestic violence from experiencing excessive psychological distress and helping her to adjust to life in the wake of a stressful encounter. Having supportive family and friends may buffer against PTSD. Therefore, the service providers should continue to assist the survivor to develop positive coping skills, to reduce their non-productive coping patterns and improve their social support resources in

order to reduce the risk factors in experiencing PTSD symptoms. Considering the psychological effects of domestic violence, further work in this area is essential to promote a better mental health among the survivors. If these findings can be extensively replicated elsewhere nationwide, it may prove useful for the generation of programmes that seek to improve the lives of women in Malaysia.

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society. Substance use has major consequences like educational problems, legal conflicts and increased mortality rate because of accidents during driving or work with electrical machines in industries, suicide, homicide and injuries [3]. Adolescent substance abuse potentially holds a number of negative implications for the health and well-being of the individual such as risk for injury and death from interpersonal violence, motor vehicle accidents, and drowning, engaging in high risk sexual behaviors and increased risk for suicidal ideation [4-6]. Researchers have shown that substance use and its patterns in university students have increased dramatically in the past decades. For example, a study in Croatian medical students suggested that substance use had increased from 14% in 1989 to 35% in 2000 [7]. In Iran, the prevalence of substance among university students was 57.7% [8].

A WHO collaborative survey of 25,916 primary care attendees found that 29% of those with poor sleep had tried medications for sleep [9]. Johnson et al. (1998) [10] found that use of alcohol, prescription drugs and over-the-counter (OTC) medications as sleep aids was fairly common. The prevalence of any substance use to aid sleep in a sample of 18–45 years' old adults was 26% [10]. Mellinger et al. (1985) [11] reported that 3.1% of the adult population had used over the counter sleeping pills and 4.3% had taken prescribed psychotropic drugs for sleep. The risks associated with use of sleeping pills include dependency [12]. When people consume consciousness-altering drugs on a regular basis, they often develop dependence – they come to need the drug and cannot function without it. The other risk factors for using sleeping pills are cognitive impairment, falls and accidental injuries [13 &14].

In Malaysia, industrialization, urbanization and increased exposure to Western life style have contributed to the spreading of substance use, with alcohol and tobacco and other substances like cocaine, heroin, amphetamine, inhalants, hallucinogens and sleeping pills. To the best of our knowledge, our study is the first study focusing on using sleep pills among Malaysian University students. Little is known about the prevalence of sleeping pills use among university students and its associated factors. This research aimed to determine the prevalence of sleeping pills use among university students and its associated factors in Malaysia.

Methods

This cross-sectional study was conducted in January 2010 among 200 students from all faculties of Management and Science University (MSU), Shah Alam, Malaysia. The survey was conducted by distributing self-administered questionnaires to MSU university students. The questionnaire consists of three parts; first part contains socio-demographic characteristics (age, sex, race, place of residence, course and BMI). The second part asked about factors that may influence using of sleeping pills such as (drinking alcohol, drinking caffeine drinks, smoking and exercise). The third part consist of clinical characteristics that may influence the using of sleeping pills such as (experienced insomnia, experienced sleep disturbance, experience stress, experienced suicide attempt, experienced anxiety and experienced headache).The questionnaire used in this study was designed based on the literature review. The students were chosen using convenience sampling by going to their faculties and distribute the questionnaire after finishing their classes. Consent was obtained from all the participants and given the questionnaires to

fill in and return it back to the researcher. Ethical approval was obtained from the ethics committee of Health and Life Sciences. Data was analyzed using SPSS version 13. The t-test was used to examine the relationships between sleeping pills use and the related factors.

Results

A total of 200 university students participated in this study. The prevalence of using sleeping pills among university students is 7.5%. The majority of the

participants were female (n = 131, 65.5%), more than or equal to 20 years of age (n =172, 86.0%). The majority of the participants were Malay (n=146, 73.0%), followed by Indian (n= 25, 12.5%). Then the lowest were Chinese participants (n=8, 4.0%). The majority was from urban area (n=169, 84.5%), from medical and health sciences background (n= 101, 50.5%). Majority of the participants were normal-weight (n= 127, 63.5%). The majority of the student (n=90, 45%) sleep about 4-6 hours/night (Table 1).

Table 1. Socio-demographic characteristics of the participants

Variable	Number (N=200)	Percentage
Gender		
Male	69	34.4%
Female	131	65.5%
Age		
< 20 years	28	14.0%
≥20 years	172	86.0%
Race		
Malay	146	73.0%
Indian	25	12.5%
Chinese	8	4.0%
Others	21	10.5%
Residency		
Urban	169	84.5%
Rural	31	15.5%
Course		
Medical & health sciences	101	50.5%
Non-medical & health sciences	99	49.5%
BMI		
Underweight <18.5	36	18.0%
Normal weight 18.5 -24.9	127	63.5%
Overweight ≥25	37	18.5%
Average of sleeping hours/night		
<4	7	3.5%
4-6	90	45%
6-8	80	40%
>8	23	11.5%

Regarding the relationships between using sleeping pills and lifestyle and habits, the majorities (n=102, 51%) of the students do not exercise. However there is no significant relationship between using sleeping pills and performing physical exercise (p=0.72). The majority of the participants (n=139, 69.5%) consumed caffeine drinks such as beverage, Nescafe and coffee 139 (69.5%). However there is no significant relationship between consuming caffeine drink and using sleeping

pills among university students (p=0.73). The majority of the participants were non-smokers (n=180, 90.0%), however there is no significant relationship between smoking and using sleeping pills among university students (p= 0.15). The majority of the participants (n= 186, 93.0%) were non-drinking alcohol, however there is no relationship between drinking alcohol and using sleeping pills among university students (p=0.32) (Table 2).

Table 2. The relationships between lifestyle and habits and using sleeping pills among the participants.

Variable	Number (N= 200)	Percentage	Mean ± SD	t	p-value
Exercise					
Yes	98	49%	1.47 ± 0.516	0.347	0.72
No	102	51%	1.51 ±0.501		
Consume caffeine drinks					
Yes	139	69.5%	1.27 ±0.458	0.468	0.739
No	61	30.5%	1.31 ±0.463		
Smoking					
Yes	20	10.0%	1.73 ±0.458	2.25	0.154
No	180	90.0%	1.91 ±0.282		
Drink alcohol					
Yes	14	7.0%	1.87 ±0.352	0.997	0.320
No	186	93.0%	1.94 ±0.247		

Regarding the relationship between using sleeping pills and clinical characteristic, the majority of the students (n = 153, 76.5%) did not experience insomnia however there is no significant relationship between using sleeping pills and insomnia among university students (p=0.20). The majority of the students (n =143, 71.5%) did not have experience with sleep disturbance, however there is no significant relationship between using sleeping pills and sleep disturbance among university students (p=0.307). The majority of the study participants (n= 135,

67.5%) do not experience stress, however there is no significant relationship between using sleeping pills and stress (p=0.246). The majority of the participants (n= 193, 96.5%) have no experience of suicide attempt, however, there is no significant relationship between using sleeping pills and experience of suicide attempt (p=0.490). The majority of the students (n=159, 79.5%) experienced headache, however there is no significant relationship between using sleeping pills and headache (p =0.05) (Table 3).

Table 3. The relationships between clinical characteristics and using sleeping pills among the participants.

Variable	Number (N= 200)	Percentage	Mean ± SD	t	p-value
Experienced insomnia					
Yes	47	23.5%	1.60 ± 0.507	1.56	0.204
No	153	76.5%	1.78 ± 0.416		
Experienced sleep disturbance					
Yes	57	28.5%	1.60 ± 0.507	1.023	0.307
No	143	71.5%	1.72 ± 0.448		
Experienced stress					
Yes	65	32.5	1.80 ± 0.414	1.072	0.246
No	135	67.5	1.66 ± 0.473		
Experienced suicide attempt					
Yes	7	3.5%	1.93 ± 0.258	0.691	0.490
No	193	96.5%	1.97 ± 0.178		
Experienced anxiety					
Yes	110	55.0	1.40 ± 0.507	0.403	0.687
No	90	45.0	1.45 ± 0.466		
Experienced headache					
Yes	159	79.5	1.07 ± 0.25	1.38	0.05
No	41	20.5	1.22 ± 0.413		

Regarding the factors that using of sleeping pills, there is no significant relationship between age and using sleeping pills (p=0.39). There is also no relationship between gender and using sleeping pills (p=0.30). There is no significant relationship between residency of the students and using

sleeping pills (p = 0.32). There is a significant relationship between using the sleeping pills and depression (p= 0.03). There is also a significant relationship between using sleeping pills and the inducing sleep by reading (p=0.04) (Table 4).

Table 4. The factors influencing the use of sleeping pills among the participants.

Variables	Number (N, %)	Mean ±SD	t	p-value
Age				
< 20 years	28 (14.0%)	0.93 ± 0.25	0.84	0.39
>= 20 years	172 (86.0%)	0.85 ± 0.35		
Gender				
Male	69 (34.4%)	1.53 ± 0.516	1.02	0.30
Female	131 (65.5%)	1.66 ± 0.473		
Residency				
Urban	169 (84.5%)	1.07 ± 0.25	0.980	0.328
Rural	31 (15.5%)	1.16 ± 0.37		
Experience depression				
Yes	49 (24.5%)	1.47 ± 0.516	2.73	0.03
No	151 (75.5%)	1.78 ± 0.416		
Induce sleep by reading				
Yes	65 (35.5%)	1.87 ± 0.35	1.65	0.04
No	135 (67.5%)	1.66 ± 0.47		

Discussion

The prevalence of using sleeping pills among university students in this study is 7.5%. Similar finding was reported by Doi et al. (2000) [15] that the prevalence of hypnotic medication use three times or more per week was 3.4% among men and 5.4% among women. Liu et al. (2000) [16] reported that 6.3% of the general population regularly used hypnotic medication or alcohol as a sleep aid. This study showed a significant relationship between using sleeping pills and depression among university students. The scenario is not clear; either the students started to have depression because of using sleeping pills or users of sleeping pills developed depression. Further and depth investigation is needed for this matter. Similar finding was reported by Kaneita et al. (2007) [17] that there is an independent association between depressive status and the use of hypnotic medication even when many items were taken as covariates for the logistic model.

In this study there is a relationship between using sleeping pills and the inducing sleep by reading this due to that all the participants were university students. In this study there is no relationship between using sleeping pills and gender. Opposite findings were reported by two studies from the United States that the use of hypnotic medication was significant among women [10 & 18]. These differences may due to the different of the population and the sample size.

In this study there is no significant relationship between caffeine consumption and using sleeping pills. Similar finding reported by Nojomi et al. (2009) [19] that there is no association between coffee consumption and quality of sleep. In the literature, there is little evidence for the associations between caffeine consuming and sleep. A survey of 760 nurses showed that family factors and age were more

important determinants of sleep than caffeine consuming [20]. Another study reported that there is no association between caffeine consuming and sleep [21]. A study of sleep among elderly women found no differences in levels of caffeine consuming between good and poor sleepers [22]. Possible explanation for these differences is that habitual consumers of caffeine are less likely to report sleep disturbances than infrequent consumers of caffeine.

Regarding the relationship between exercise and sleep, the American Sleep Disorders Association considers physical exercise to be a modality of non-pharmacological treatment for sleep disorders [23]. Previous studies showed that exercise is perceived to be sleep promoting and associated with less daytime sleepiness [24-26]. In this study there is no significant relationship between the using sleeping pills and exercise. This may be due to in the questionnaire there is only one general question asking if the participants exercise or not without determination the duration, frequency and type of the exercise.

In this study there is no significant relationship between drinking alcohol and using sleeping pills. This may be due to there is a small number of the participants that drink alcohol. Previous studies have showed that alcohol tends to shorten sleep latency, reduce rapid eye movement sleep, and increase non-rapid eye movement sleep, which makes alcohol immediately rewarding as a hypnotic [27 & 28] but because of it is metabolized rapidly and then its hypnotic effect does not last long [29]. The limitation of this study is that it is a cross-sectional study, and so causal relationships could not be determined, even for items between which an association was indicated.

Conclusion

The prevalence of sleeping pills usage among university students is relatively high. This study showed that there is a significant relationship between using sleeping pills and depression. Education regarding using sleeping pills and its side effect is needed among university students.

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chronic stress was associated with many unwanted consequences on one's wellbeing.

Stress is defined as the body's nonspecific response or reaction to demands made on it, or to disturbing events in the environment [11-12]. It is not just a stimulus or a response but it is a process by which we perceive and cope with environmental threats and challenges [13]. Personal and environmental events that cause stress are known as stressors [14]. Stress is simply defined as emotional disturbances or changes caused by stressors. Linn & Zeppa [15] stated that some stress in medical training is needed for learning. Stress which can promote and facilitate learning is called 'favourable stress' and stress which can inhibit and suppress learning is called 'unfavourable stress'. The same stressors may be perceived differently by different medical students, depending on their cultural background, personal traits, experience and coping skills. An optimal level of stress, referred earlier as 'favourable stress', can enhance learning ability [16]. However, excessive stress can lead to physical, emotional and mental health problems [17], reduce self-esteem [16, 18] and may affect postgraduate students academic achievement, personal and professional development [9].

Stressors, among postgraduate generally can be grouped into six groups: nature of job related stressor, interpersonal relationships related stressors, organizational working environment related stressor, work-family conflicts related stressors, and profession prospects related stressor [19]. Another

possible group of stressor particularly for postgraduate medical trainees was related to academic training. It is noteworthy that the stressors may vary between institutions. Therefore, understanding the nature of stressors of postgraduate students may help medical teachers find ways to reduce the unwanted consequences of the stressors on the students' wellbeing in the future.

Based on previous studies, prevalence and sources of stress among undergraduate medical students was well established [1-10], however, for postgraduate medical trainees there is very limited data on this. Thus, the purpose of this small scale pilot study was to gather initial data on prevalence and sources of stress among postgraduate students.

Methodology

Study design and sample size

A cross-sectional study design was used in this preliminary study. Sample size was determined based on the Roscoe rule of thumb which recommended that 30 subjects were adequate for a preliminary study [20]. The study sample size calculated after taking 20 percent drop out rate into consideration was 38 subjects. Non-probability convenient sampling method was applied in selecting study subject. The study population was the postgraduate students of School Medical of Medical Sciences, Universiti Sains Malaysia. Study subjects were selected from three main fields; basic sciences, surgical-based and medical-based master programmes.

Data collection

The GHQ-12 was used to measure participants' stress level and the PSQ was used to identify sources of stress. The questionnaire was self-administered. It was administered to all postgraduate students during face to face session in a hall during the postgraduate personal and professional development workshop. The total number of workshop participant was thirty seven. The students were told to follow the instructions written in the questionnaire. All data collection was done by two investigators. The process to fill in the questionnaire took about 15 minutes to finish and they were to be returned on the same day.

The GHQ-12 is a well-validated instrument used to measure overall emotional wellbeing and commonly used in studies looking into distress in populations [21-26]. It is one of the most widely used measurement tool to measure stress level. Reliability coefficients of the questionnaire have ranged from 0.78 to 0.95 in various studies. The items of GHQ-12 represent 12 manifestations of stress and respondents were asked to rate the presence of each of the manifestations in themselves during recent weeks. This is done by choosing from four responses, typically being 'not at all', 'no more than usual', 'rather more than usual' and 'much more than usual'. The scoring method is a binary scoring method where the two least symptomatic answers score 0 and the two most symptomatic answers score 1 – i.e. 0-0-1-1. The GHQ-12 scores range from 0 to 12. Caseness was considered as a score of 4 or more [26, 27]. The sensitivity and specificity of the GHQ-12 score at cut-off

point of 4 were 81.3% and 75.3% respectively with positive predictive value of 62.9% [21, 26, 27]. Participants who scored GHQ-12 equal to 4 and above were considered as having significant distress and taken as 'case' in this study.

The PSQ is a modified stressor questionnaire developed based on two validated stressor questionnaire designed by Chan et al. [19] and Muhamad et al. [28]. The modification was done to ensure suitable and relevant items included in the PSQ to measure the postgraduate stressors. The PSQ have 28 items with 7 domains; academic, performance pressure, work-family conflicts, bureaucratic constraints, poor relationship with superior, poor relationship with colleagues and poor job prospect. Each of these domains consists of four items. The items of PSQ were rated under 5 categories of responses (causing no stress at all, causing mild stress, causing moderate stress, causing high stress, causing severe stress) to indicate intensity of stress caused by them.

Verbal consent was obtained from the participants. Permission and ethical approval was obtained from the School of Medical Sciences, Universiti Sains Malaysia prior to the start of the study. The questionnaires were permitted to be used in this study.

Statistical analysis

The collected data was analysed using Statistical Package for Social Sciences (SPSS) version 12. Data were entered, checked for data entry errors, explored and cleaned. Reliability analysis was applied to

test the internal consistency (reliability) of the PSQ; it is considered as having high internal consistency if the Cronbach's alpha value is more than 0.7 [29]. Descriptive statistics was applied for analysis of the demographic data, the percentage of distressed students was determined based on GHQ-12 score, and stress intensity caused by the stressors.

Results

A total of 33 participants were involved in this study, out of whom 19 (57.6%) were female. Majority of participants were Malays, 32 (97%), and the rest was Chinese. The participants come from various field of study; basic sciences, surgical-based and medical-based master programmes.

Reliability analysis shows that the Cronbach's alpha value for The PSQ was 0.95. Whereas, Cronbach's alpha values for academic, poor relationship with superior,

bureaucratic constraints, work-family conflicts, poor relationship with colleagues, performance pressure, and poor job prospect domains were 0.63, 0.84, 0.81, 0.65, 0.73, 0.78, and 0.70 respectively. The analysis shows the PSQ is a reliable tool in identifying postgraduates' stressors. The percentage of distressed participants was 36.36% which is in the high side.

Table 1 lists the stressors rated by participants. The top ten stressors were tests and examinations, large amount of content to be learnt, time pressure to meet deadlines, doing work beyond ability, work overload, unfair assessment by superior, fears of making mistakes that can lead to serious consequences, doing mentally straining work, work demands that affect personal and home life, and lack of time to review what have been learnt. Most of the stressors were related to academic and performance pressure as shown in table 2.

Table 1: Ranking of stressors according to the stress intensity perceived by postgraduate medical trainees.

Rank	Item	Stress intensity by postgraduate students*	
		Mean	Standard Deviation
1	Tests/examinations	2.91	0.80
2	Large amount of content to be learnt	2.48	1.39
3	Time pressures and deadlines to meet	2.42	1.06
4	Having to do work outside of my competence	2.36	1.62

5	Work overload	2.21	0.93
6	Unfair assessment from superior	2.12	1.65
7	Fear of making mistakes that can lead to serious consequences	2.15	1.12
8	My work is mentally straining	2.15	1.58
9	Work demands affect my personal/home life	1.97	0.77
10	Lack of time to review what have been learnt	1.94	0.83
11	Absence of emotional support from family	1.88	1.85
12	Advancing a career at the expense of home/personal life	1.82	1.01
13	Feeling of being underpaid	1.79	1.71
14	Having difficulty understanding the content	1.79	1.60
15	Lack of promotion prospects	1.76	1.60
16	Working with uncooperative colleagues	1.70	1.26
17	Relationship problems with colleagues/subordinates	1.67	1.67
18	My beliefs contradict with those of my superior	1.61	1.68
19	Cannot participate in decision making	1.58	1.58
20	Unable to make full use of my skills and ability	1.58	0.66
21	My life is too centered on my work	1.58	1.03
22	Lack of support from superior	1.52	1.12

23	Lack of authority to carry out my job duties	1.48	1.03
24	Working with incompetence colleagues	1.45	1.00
25	Competition among colleagues	1.39	1.56
26	Difficulty in maintaining relationship with superior	1.27	0.94
27	Feeling insecure in this job	0.97	1.01
28	Society does not think highly of my profession	0.61	0.61

*0.00 – 1.00 = Causing none to mild stress, 1.01 – 2.00 = Causing mild to moderate stress,
2.01 – 3.00 = Causing moderate to high stress, 3.01 – 4.00 = Causing high to severe stress

Table 2: Ranking of stressor domains according to the stress intensity perceived by postgraduate medical trainees.

Stressor domain	Stress intensity perceived by postgraduate students*	
	Mean	Standard Deviation
Academic	2.16	0.79
Performance pressure	2.13	0.82
Work-family conflicts	1.70	0.71
Bureaucratic constraints	1.56	0.71
Poor relationship with superior	1.50	0.85
Poor relationship with colleagues	1.40	0.79
Poor Job prospect	1.12	0.59

*0.00 – 1.00 = Causing none to mild stress, 1.01 – 2.00 = Causing mild to moderate stress,
2.01 – 3.00 = Causing moderate to high stress, 3.01 – 4.00 = Causing high to severe stress

Discussion

The sample size in this pilot study was relatively small and not representing the actual distribution of the study population in

term of gender, ethnic groups, years of study and religion. Therefore, the findings should be interpreted cautiously. Apart from that,

this pilot study has provided a useful data in order to calculate an appropriate sample size for future studies.

The prevalence of distressed postgraduate students was relatively high compared to the normal population which is less than 10% as reported by Firth [3]. However, the prevalence is relatively similar to the stress prevalence in undergraduate medical students' population which was 30% to 50% as reported in many studies [1-10]. The similarity is perhaps due to similar training environment that both undergraduate and postgraduate medical students faced. This prevalence of distress is also relatively higher compare to the prevalence in non-medical students: 29.2% in economic and physical education students as reported by Aktekin et al. [1]. This alarming finding suggested a sense of growing pressure among the postgraduate students. However, since this a preliminary data, further study with larger sample size should be done to confirm this finding.

This present study found that the major stressors in postgraduate medical training were related to academic and performance pressure. The sources of stress among postgraduates were relatively similar to the stressors in the undergraduate medical students which were also related to the academic demands as reported by previous studies [1-10, 30, 31].

This present study also shows that test and examination, too much content to be learnt, time pressures are the three most stressful events perceived by the postgraduate student followed by other stressors as shown in table

1. It is noteworthy that the stressors rated highly by postgraduate were relatively similar to those rated highly by undergraduate medical students such as test and examinations, too much content to be learnt, lack of time to do revision, and time pressures as reported by previous studies [1-10, 30, 31]. The similarity is perhaps due to similar training environment that both undergraduate and postgraduate medical students faced.

It is interesting to highlight that, compared to undergraduate medical students, unfair assessment by superiors (supervisors) and doing work that is out of their ability were perceived as stressful events by the postgraduate students. It highlights that supervisor assessment and the kind of tasks given influence the stress level of postgraduate students. It follows that fair assessment, appropriate and clear task given to the students will reduce their stress level. Further studies should be conducted to confirm this hypothesis and to explore further the risk factors that contribute to postgraduates' stress level.

In conclusion, this small study has shown that the prevalence of distressed postgraduate medical students is high and alarming. The major stressors that have been faced by the students were related to academic and performance pressure.

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