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Psychological Distress of First Year Medical Students Who Underwent Two Different Admission Processes During a Stressful Period

(Distres Psikologi dalam Kalangan Pelajar Perubatan Tahun Pertama yang Melalui Dua Proses Kemasukan Berbeza Semasa Tempoh yang Tertekan)

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ABSTRACT

The study of medicine is often regarded by students as a stressful environment particularly during examination period. Studies found a high percentage of medical students experience significant psychological distress during the examination period. This study compared percentage and level of psychological distress between two batches of first year medical students who underwent different selection admission processes during a stressful examination period. A comparative cross-sectional study was done on two batches of first year medical students; one group selected based on academic merit (2008/2009 batch) and the other selected based on academic merit, psychometric tests and interview (2009/2010 batch). The psychological distress was measured by the 12-item general health questionnaire (GHQ-12). The data were collected right after the final examinations. A total of 99 (46.05%) medical students of the 2008/2009 batch and 196 (100%) medical students of the 2009/2010 batch participated. The percentage of medical students who had psychological distress of the 2008/2009 and the 2009/2010 batches were 58.59% and 42.3%, respectively. The mean GHQ-12 score and percentage of psychological distress were significantly different between the two batches ($p< 0.01$*). The older batch had 2.01 times higher risk for developing psychological distress compared with the newer batch (*$p< 0.01$*). The newer batch of medical students had better psychological health status and was less likely to develop psychological distress during the stressful period compared with older batch.*

Keyword: Medical student; medicine; mental health; psychological health; student admission

ABSTRAK

Pengajian perubatan sering dianggap oleh pelajar sebagai persekitaran yang tertekan terutamanya semasa tempoh peperiksaan. Kajian mendapati peratusan yang tinggi dalam kalangan pelajar-pelajar perubatan mengalami tekanan psikologi yang ketara sepanjang tempoh peperiksaan. Kajian ini membandingkan peratusan dan tahap tekanan psikologi antara dua kumpulan pelajar tahun pertama perubatan yang menjalani proses pemilihan kemasukan yang berbeza sepanjang tempoh peperiksaan yang sukar. Satu kajian perbandingan keratan rentas telah dilakukan ke atas dua kumpulan pelajar tahun pertama perubatan; satu kumpulan dipilih berdasarkan merit akademik (kumpulan 2008/2009) dan yang lain dipilih berdasarkan merit akademik, ujian psikometrik dan temu duga (kumpulan 2009/2010). Tekanan psikologi telah diukur menggunakan soal selidik kesihatan am 12-item (GHQ-12). Data telah dikumpulkan sejurus selepas peperiksaan akhir. Sebanyak 99 (46.05%) pelajar perubatan bagi kumpulan 2008/2009 dan 196 (100%) pelajar perubatan bagi kumpulan 2009/2010 telah mengambil bahagian. Peratusan pelajar perubatan mempunyai tekanan psikologi bagi kumpulan 2008/2009 dan 2009/2010 adalah masing-masing 58.59% dan 42.3%. Purata skor GHQ-12 dan peratusan tekanan psikologi adalah jauh berbeza antara kedua-dua kumpulan ($p<0.01$*). Kumpulan terdahulu mempunyai 2.01 kali lebih tinggi risiko untuk mengalami tekanan psikologi berbanding dengan kumpulan baru (*$p<0.01$*). Pelajar-pelajar perubatan daripada kumpulan baru mempunyai status kesihatan psikologi yang lebih baik dan adalah kurang berkemungkinan untuk mengalami tekanan psikologi dalam keadaan tertekan berbanding dengan kumpulan terdahulu.*

Kata kunci: Kemasukan pelajar; kesihatan mental; kesihatan psikologi; pelajar perubatan; perubatan

INTRODUCTION

Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity (World Health Organization 2007). Mental health is referred to a state of well-being enabling people to realize their abilities, cope with normal stresses of life, work productively and fruitfully and make contributions to their communities (World Health Organization 2003). For all individuals, mental health is crucial to determine their overall well-being. The importance of mental health is becoming more apparent whereby it contributes to the overall well-being of societies and countries (World

Health Organization 2003). Many studies have found that medical education is not in an optimal state and might, in fact, be a health hazard for new and young incoming medical students (Dyrbye et al. 2005, 2006; Shapiro et al. 2000; Wolf 1994). Studies have revealed a high prevalence of psychological distress among medical students particularly in the first year of studies where they are adjusting to the new environment of medical training and the poorest psychological health was reported during examination periods (Dyrbye et al. 2005, 2006; Yusoff 2011; Yusoff et al. 2011a, 2010a). Psychological distress among medical students became twice as prevalent between the beginning and the end of the first year (Vitaliano et al. 1989). The main causes and sources of stress among medical students are mainly related to medical training particularly examinations as they were perceived by medical students as the most stressful event (Dyrbye et al. 2005; Yusoff et al. 2011a, 2010a). The risk of medical students developing psychological distress was double during examinations compared with the non-examination period (Yusoff 2011). Psychological distress was associated with physical and mental health problems (Dyrbye et al. 2005, 2006). Muller in 1984 echoed a concern that medical training is hazardous to psychological health of medical students (Wolf 1994).

The aim of medical education is to produce healthy and competent doctors who will serve societies and promote the health of all people (Wolf 1994). As discussed previously, some aspects of medical training cause negative impact on medical students' physical, emotional and mental health and therefore jeopardize this aim (Dyrbye et al. 2005). Thus, student admission process is crucial to medical training because the kind of students recruited at the beginning determine the kind of doctors produced at the end (Downie et al. 1992; McManus & Vincent 1997). Methods of selection generally are grouped into cognitive and non-cognitive types; cognitive methods usually look at previous academic performance whereas non-cognitive methods look at personal qualities such as communication skills, reasoning skills, emotional intelligence and personality. Many medical schools prefer to select their medical students based purely on previous academic achievement because it was found to be a better predictor of student academic performance during medical training (Cohen-Schotanus et al. 2006; McManus & Vincent 1997; Moruzi & Norman 2002; Tutton & Price 2002). However, high academic performance does not necessarily make a good doctor in the future (Norman 2004; Tutton & Price 2002) and furthermore the predictive capacity of previous academic achievement fades with progression through the medical study (Tutton & Price 2002). A suggested reason for this is an imbalanced state of psychological health that hindered them from working productively and fruitfully and to realize their abilities as well as their values (World Health Organization 2003). Eventually this led to poor performance of future doctors including errors of judgment leading to medical errors, poor quality of care leading to negligence, poor personal qualities leading to fraud and dishonesty, inability to work in team, lack of social and communication skills and poor mental health (McManus & Vincent 1997). Thus medical students should be selected based on criteria that include desirable characteristics that will predict future performance of medical students (McManus & Vincent 1997; Powis 2008).

A landmark move was made by Newcastle University authorities almost 40 years ago where they introduced personal qualities assessment in their selection process. They selected their medical students based on two tracts; in one tract students were selected based merely on previous academic achievement (top 1-2%) and in the other students were selected based on previous academic achievement (top 10%) and a personal qualities assessment via a written test and an interview (Vinson et al. 1979). After a 9-year period, they found no relationship between previous academic performance and any of the outcomes measured. However, they did find that the personal qualities assessment measures had associations with the outcomes measured and those who performed well during the interview had greater chances of completing their studies at medical school with honors (Powis et al. 1988). This study has influenced the medical student admission process in many countries.

Since June 2009, the School of Medical Sciences, Universiti Sains Malaysia was given semi-independent authority to select their own medical students by the Malaysian government. The selection from the primary pool (based on academic merit) and from the secondary pool (based on psychometric assessment) are done by the Ministry of Higher Education. The university then selects its medical students from the tertiary pool (shortlisted candidates) based on interview performance (Yusoff et al. 2011b).

This study aimed to compare percentage and level of psychological distress of first year medical students who underwent different admission processes during a stressful examination period; one batch selected based purely on previous academic merit and another batch (newer) was selected based on academic merit, psychometric test and interview.

Methods

A comparative cross-sectional study was done. The study populations were new first-year medical students of the 2008/2009 and 2009/2010 academic sessions in the School of Medical Sciences, Universiti Sains Malaysia (USM).

The first-year medical students of the 2008/2009 academic session were selected solely based on academic merit which was the cumulative grade point average (CGPA) of the Science Foundation Course (matriculation) of the Malaysian Ministry of Education or equivalents which were the High School Certificate of Malaysia (HSC) and Advanced Level General Certificate of Education (A-Level). The newer batch of first-year medical students (2009/2010) was selected based on previous academic

merit (similar to the older batch) plus psychometric assessment and interview performance. The Malaysian universities selection yearly inventory (MUnSYI) was used as the psychometric assessment to assess the suitability of candidates for medical study. Shortlisted applicants were selected based on their previous academic merits and the psychometric assessment, were then called for an interview. The main objectives of the interview were to assess the interest, general knowledge and expectations of applicants about medical education and medical career, to assess the personal attributes of the applicants in relation to their suitability in studying medicine at USM, to assess the applicants' adequacy in communicating in both Malay and English languages as basic requirements for a successful medical study and to observe any physical traits that might hinder the applicants from completing the medical studies or performing clinical functions.

All the new first-year medical students from the 2008/2009 and 2009/2010 academic sessions were selected as study subjects. The total number of the first year medical students enrolled in the 2008/2009 academic session was 215 while the newer batch (2009/2010) was 196. Both batches underwent a similar curriculum structure in terms of content, teaching and learning methods and assessment. Both batches also studied in the same physical and learning environment. Researchers obtained permission and clearance from the School of Medical Sciences and the Human, Research and Ethics Committee of Universiti Sains Malaysia prior to the conduct of the study.

Data Collection

The 12-item self-administered general health questionnaire (GHQ-12) was used in this study. Demographic data pertaining to sex (male, female), race (Malay, Chinese, Indian and other) and entry qualifications (matriculation, HSC and A-Level) were obtained from the participants. Data for both groups were collected right after the final paper of the first year final examination as it was considered as the most stressful period for the medical students (Dyrbye et al. 2005; Vitaliano et al. 1989; Yusoff 2011; Yusoff et al. 2011a, 2010a).

The GHQ-12 is a widely-used instrument to measure psychological distress (Goldberg 1978; McDowell 2006). It was validated in many populations including medical students (Goldberg et al. 1997; McDowell 2006). Reliability coefficients of the questionnaire have ranged from 0.78 to 0.95 in various studies (Jackson 2007). The items of GHQ-12 represent 12 manifestations of stress and respondents were asked to rate the presence of each manifestation 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 minimum and maximum scores of the GHQ are 0 and 12, respectively. 'Psychological distress' was considered as a score of 4 or more (Goldberg 1978; McDowell 2006; Yusoff et al. 2010b).

The GHQ was administered to all first year medical students of the 2008/2009 batch by senior medical students whereas for the 2009/2010 batch it was administered by the researcher right after final paper of the examination. Completion of the questionnaire was voluntary and would not affect their progress in the course. The data were collected by guided self-administration. The time taken by the students to fill in the questionnaire was around 10 min. The questionnaires were collected right after its completion.

The data were analysed using predictive analytics softWare (PASW) version 18. In this study, we used alpha (α) at 0.05 and a confidence interval of 95%. The descriptive statistics were applied for analysis of the demographic data and the students' stress prevalence based on their GHQ-12 score. The independent-t test was used to compare mean GHQ scores between the two batches. The Chi-square test was used to compare the percentages of distressed medical students between the two batches. The binary logistic regression was applied to determine risk of developing psychological distress among the medical students of the 2008/2009 batch compared with the 2009/2010 batch.

Results

A total of 99 (46.05%) year 1 medical students of the 2008/2009 batch participated in this study compared with 196 (100%) students of the 2009/2010 batch. The response rate of the newer batch is considered as very good compared with the older one. One of reasons was due to different individual who administered and collected the questionnaires.

The demographic profile of medical students is shown in Table 1. The compositions of male and female students as well as the entry qualifications for both groups were homogenous ($p>0.05$). However, distribution of ethnic group between the two batches was heterogeneous ($p<0.05$).

The independent-t test analysis showed a significant difference of mean GHQ score between the 2008/2009 batch (mean=4.39, SD=2.98) and the 2009/2010 (mean=3.45, SD=3.15) batch (t (df)=2.43 (286), mean difference (CI 95%)=0.94 (0.18, 1.69), $p<0.05$).

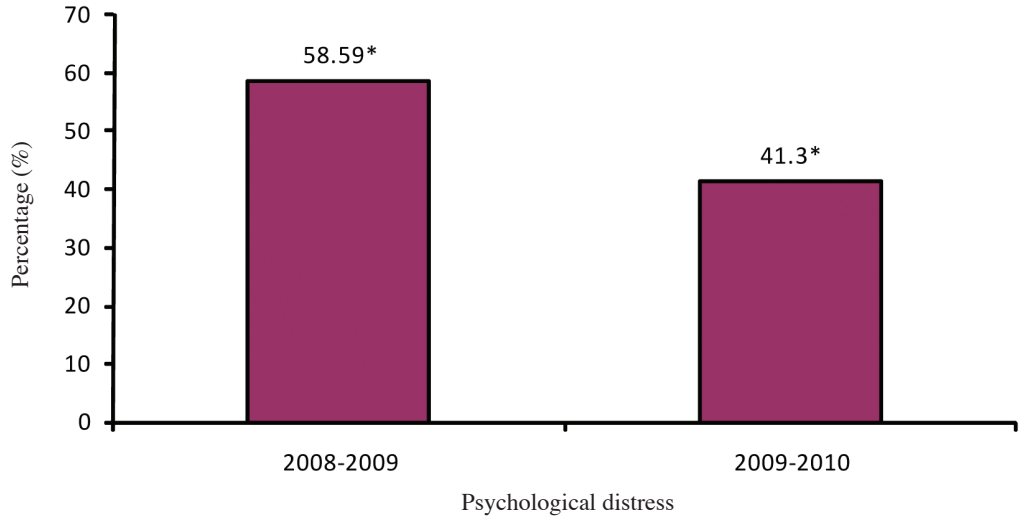
The Pearson chi-square test analysis showed a significant difference of percentage medical students had psychological distress between the 2008/2009 batch (58.59%) and the 2009/2008 batch (41.30%) (x^2 (df)=7.86 (1), $p<0.01$) as shown in Figure 1.

The binary logistic regression showed the 2008/2009 batch as having 2.01 times higher risk of developing distress compared with the 2009/2010 batch during the examination (B = 0.70, Wald (df)=7.76 (1), odd ratio (CI 95%)=2.01 (1.23, 3.28), $p<0.01$ Nagerkerke $r^2 = 0.035$, -2 log Likelihood=400.1, $x^2=7.88$, $p<0.01$,). The findings showed the newer batch had better psychological health compared with the older batch.

TABLE 1. Profiles of medical students

Variable	*n* (%)		x^2 statistics (df)*	*p*-value*
	Academic session 2008/2009 (*n*=99)	Academic session 2009/2010 (*n*=196)		
Gender				
Male	36 (36.4)	68 (34.7)	0.08 (1)	0.77
Female	63 (63.6)	128 (65.3)		
Race				
Malay	70 (70.7)	105 (53.6)	8.76 (3)	0.033
Chinese	21 (21.2)	61 (31.1)		
Indian	7 (7.1)	22 (11.2)		
Others	0 (0.0)	8 (3.6)		
Entry qualification				
Matriculation	86 (86.9)	174 (88.8)	0.60 (2)	0.79
HSC	9 (9.1)	13 (6.6)		
Others	4 (4.0)	9 (4.6)		

*Pearson chi-square test, $p<0.05$ was considered as significant level



The Pearson chi-square test was applied, *$p<0.01$

FIGURE 1. Percentage of first year medical students had psychological distress according to the batches

DISCUSSION

The percentage of medical students experienced significant psychological distress of the 2008/2009 and 2009/2010 batches during stressful examination period were 58.59% and 43.3%, respectively. These percentage are higher compared at the beginning of first year medical students as measured in a previous study (Yusoff et al. 2010a). This rise is understandable as the data was collected right after the final examination as it was a very stressful period perceived by medical students (Aktekin et al. 2001; Vitaliano et al. 1989; Yusoff 2011; Yusoff et al. 2010a). Apart from that, statistical analysis showed the percentages of psychological distress the 2009/2010 batch were significantly lower compared with the 2008/2009 batch. This finding demonstrated that the newer batch had better psychological health status compared with the older batch. This finding suggested a potential benefit of admission process based on multiple tools with regards to its ability to pick up medical students with good psychological health status during stressful period. This fact also indirectly suggested that the newer batch of medical students coped better than the older batch with stressful situation.

The mean GHQ score of the older batch was found to be significantly higher than the newer batch. This finding indicated that medical students that were selected based on multiple tools had better psychological health status compared with admission process based purely on academic merit. It also indirectly suggested the newer admission process was able to identify medical students that have better coping ability with stressful situation. Many researchers emphasized that early detection and intervention may buffer the negative effects of stressful

situations caused by medical training on the students' psychological health in future (Aktekin et al. 2001; Dyrbye et al. 2005; Guthrie et al. 1998, 1995; Shapiro et al. 2000).

The older batch was also significantly at 1.2 to 3.3 time higher risk for developing psychological distress during stressful examination period compared with the latter batch. This finding indicated that the newer batch was less vulnerable to develop psychological distress compared with the older batch. This fact provided evidence to support a good effect of admission process based on multiple tools on psychological health of medical students recruited. It should be reminded that the aim of admission process is not to pick candidates for specific jobs but rather to choose multi-potential persons with healthy psychological health who will eventually find their interest and niche somewhere in medicine to bring the medicine to a higher level (Richards & Stockhill 1997).

All these findings indicated a better psychological health of the newer batch compared with the older batch. As the two batches went through an identical curriculum structure and an identical physical and learning environment, we postulated that the admission process based on multiple tools was able to pick up candidates with a better psychological status. Its ability of picking up resilient candidates is important as all stakeholders stand to lose if new medical graduates, no matter how superior they are in terms of cognitive or clinical competency, are not able to stand the rigors of the medical career, especially the house officer training period. This is in line with new evidence which found that purely cognitive superiority doesn't protect medical students from psychological distress even up to the house officer level (West et al. 2010).

Despite the encouraging findings, there are limitations that should be considered in future research. The first limitation is related to study design: a cross-sectional study is a snapshot at a particular time. A prospective study design should be able to confirm these present findings. The second limitation is related to the sample size where the sample was unequal which may compromise accuracy of the findings. Studies with better sample sizes are required in the future. The third limitation was related to single psychological health measurement used in this study where it did not represent the whole picture of psychological health. Therefore, multiple psychological health measurements should be used to follow up these two cohorts. Finally, no other factors than the one studied (i.e. the admission process) were addressed or controlled for in this study. Future study should control other factors that might influence the psychological distress of the students to verify the present finding. Taking all these limitations into consideration, thus the findings of this study should be interpreted with caution.

Conclusion

The newer batch of medical students selected based on academic merit, psychometric test and interview performances had better psychological health status and were less likely to develop psychological distress during a stressful period compared with older batch. This study suggested a potential benefit of admission process based on multiple tools regarding its ability to identify medical student with good psychological health during a stressful period.

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