

ORIGINAL ARTICLE

The construct validity and internal consistency of the Postgraduate Stressor Questionnaire among postgraduate medical trainees

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Abstract

Objective: To determine the construct validity and the internal consistency of the Postgraduate Stressor Questionnaire (PSQ) among postgraduate medical trainees hence it could be used as a valid and reliable instrument to identify stressors among them.

Methods: Items of the PSQ were derived from a review of literature on the subject and a discussion with experts in the field. It comprised of 28 items with seven hypothetical groups. The content and face validity was established through discussion with experts from field of Medical Education and Psychiatry. It was administered to all participants (N = 34) of postgraduate personal and professional development programme in a Malaysian university. Data was analysed using Statistical Package Social Sciences (SPSS) version 18. Factor analysis was applied to test construct validity whereas reliability analysis was applied to test internal consistency of the PSQ.

Results: Thirty three postgraduate medical trainees participated in this study. Factor analysis found that the 28 items of the PSQ were loaded nicely into the seven pre-determined groups as their factor loading values were more than 0.3. The reliability analysis showed that the Cronbach's alpha value for The PSQ was 0.95. Whereas, The 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.

Conclusion: This study showed that the PSQ is a reliable and valid instrument to identify stressors of postgraduate medical trainees. It is a promising instrument that can be used in future to explore further on this area.

Keywords: Medical training, stressors, stress, coping, postgraduate.

Introduction

Postgraduate medical training environment has always been regarded as highly stressful to students. The stressors related to medical training and its associated

negative consequences to the mental, emotional and physical health, particularly for undergraduate medical students, have been described in many studies (1-10), however, for postgraduate students there is very

limited data on this. Therefore this small study was an attempt to fill in the gap.

Sources of stress 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 (11). Another possible group of stressor particularly for postgraduate medical trainees was related to academic training (12). It is noteworthy that the stressors may vary between institutions (13, 14). 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.

Sources of stress among undergraduate medical students was well established (1-10), however, for postgraduate medical trainees the available data is scarce particularly in Malaysia. Thus, the purpose of this small scale study was to gather initial data on the validity and reliability of an instrument, the Postgraduate Stressor Questionnaire (PSQ), in identifying the sources of stress among postgraduate trainees in a Malaysian medical school. It is hoped that data obtained from this study will provide useful information for future studies.

Methodology

Study design and sample size

A cross-sectional study design was used in this preliminary study. Non-probability convenient sampling method was applied where all postgraduate medical trainees involved in the personal and professional development workshop were selected as the study subjects. The trainees were from the School of Medical Sciences, Universiti Sains Malaysia. The study subjects were selected from three main fields; basic sciences, surgical-based and medical-based master programmes.

The Postgraduate Stressor Questionnaire (PSQ)

The PSQ is a modified stressor questionnaire developed based on two validated stressor questionnaire designed by previous researchers (11, 16, 17). 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.

Academic related stressor is referred to any scholastic, university, college, educational or student events that cause stress on students. These include examination systems, assessment methods, grading methods, academic schedule, students activities related to academic events such as getting poor mark in examination, high-self expectation to do well in the study, large amount of content to be studied, having difficulty to understand content, lack of time to do revision, learning context full of competition, and having difficulty to answer question given by teachers (16, 17).

The relationship with superior and colleagues' related stressor can be described as interpersonal relationship events that can cause distress feelings to a person such as lack of support from superior, uncooperative colleagues, unfair assessment from supervisor and incompetence colleagues (18-20).

The bureaucratic constraints related stressor can be described as organizational working environment that can cause distress feeling to a person such as lack of support from authority, having to do task out of ability, and lack of opportunity in decision making (11, 18, 19).

The work-family conflicts related stressor can be described as work events that compromise a person's personal and home life that lead to distress feelings such as life is too centered on working, advancing career at the expense of personal or home life and work demands affect personal life (18, 19).

The performance pressure related stressor can be described as work demands that cause emotional disturbances to a person such as work overload, short duration given to complete tasks and doing high risk task where any mistake can lead to disastrous consequences (18-21).

The job prospect related stressor can be described as events related to reward and recognition given to an individual that cause distress feelings such as lack of promotion prospect, feeling of being underpaid, and lack of recognition to the job (11, 16-20).

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.

In order to establish the applicability, face and content validity of the PSQ, the items were subjected to experts' evaluation. The experts were drawn from the field of Medical Education and Psychiatry. They were encouraged to comment, criticize and express their doubts freely. Necessary modifications were made with the feedback given by the experts.

Data collection

The PSQ was administered to the participants during face to face sessions in a hall. All data collection was done by investigators. The participants were told to follow the instructions. The process of filling the questionnaire took about 15 to 25 minutes and the questionnaire was to be returned on the same day.

Verbal consent was obtained from the participants. Clearance was obtained from the medical school prior to the start of the study.

Reliability analysis

Reliability analysis was done to determine the reliability of the questionnaire. Internal consistency of the items was measured by using Cronbach's alpha coefficient. The items of PSQ were considered to represent a measure of high internal

consistency if the total alpha value was more than 0.7 (22).

Factor Analysis

Collected data was analysed using Statistical Packages Social Sciences (SPSS) version 18. Factor Analysis was done to determine the construct validity of the PSQ. Kaiser-Meyer-Olkin (KMO) test and Bartlett's test of sphericity was applied to measure the sampling adequacy (23). The sample was considered adequate if i) KMO value was more than 0.5 and ii) Bartlett's test was significant (p-value less than 0.05). Principal Component Analysis (PCA) method was applied in extraction of components. Components with Eigenvalues of over 1 were retained as components. With the assumption of all items were uncorrelated with each other, Varimax rotation was applied in order to optimize the loading factor of each item on the extracted components. Items with loading factor of more than plus or minus 0.3 were considered as an acceptable loading factor (23).

Result:

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 showed that the PSQ is a reliable tool in identifying postgraduates' stressors.

The factor analysis showed that all 28 items have factor loading more than 0.3 (table

1); it indicated that all items were nicely fit on each component. It also suggested PSQ had a good construct. Factor analysis showed that there were 5 components had Eigenvalue more than 1, however, the extraction was forced into 7 components. The total variance explained by the 7 components was 84.7%. These findings showed that the PSQ is a valid instrument to identify stressor among house officers. It is worth to highlight that the Bartlett's test of sphericity was significant ($p < 0.001$), but the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was lower than 0.5 (table 1) which reflected the inadequacy of study sample for factor analysis.

Discussion

Reliability generally is defined as reproducibility of measurement over time or occasions, whereas validity is generally defined as to what extent the measurement measures what it should measure (22-25). The purpose of this small study is to determine the validity and reliability of a newly developed instrument, the PSQ, which could be very useful in the future to identify stressors among postgraduate medical trainees. The Cronbach's alpha value is commonly used to determine the internal consistency of an instrument, whereas factor analysis is used to determine the construct of an instrument. In this study, the same analyses were applied.

The reliability analysis suggested that the PSQ shown high internal consistency as its Cronbach's alpha value was more than 0.7 (22); this reflected the consistency and reproducibility (reliability) of the instrument in identifying stressors among house officers. Most of the stressor groups have shown a measure of acceptable internal consistency as having Cronbach's alpha value of more than 0.6 as shown in table 1; it is another evidence to support the reliability of the GSQ (22, 25). The reliability analysis also suggested that all the 28 items have corrected-item total correlation value of more than 0.3 except item no 1 as shown in table 2, therefore all

the items were remained in the PSQ and item no 1 must be reviewed again. These findings are evidence to support and suggest that the PSQ is a reliable instrument that could be used in the future to identify stressors among postgraduate medical trainees. Perhaps, similar study with better sample size can be conducted in the future to confirm these findings.

The factor analysis has shown that the total variance explained by the seven components after forced extraction was 84.7% (table 1) which indicates most of the stressor among house officers was explained by the seven components; this finding suggested that the PSQ measured what it should measure. As shown in table 1, all the 28 items fit very well into the seven components as all the items had loading factor of more than 0.3 (23); It reflects that the PSQ had a good construct as well as it is an evidence to support the instrument measured what it should measure. The present study findings have provided evidence to support that the PSQ is a promising instrument to determine stressors among house officers or junior doctors. However, it is recommended that future studies with better sample size should be carried out to confirm these findings.

This study has several limitations that should be considered in the future studies. 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. Furthermore, convenient sampling method that was used in this study may lead to sample bias which may compromise accuracy of the result. Furthermore, the KMO value was less than acceptable level for the factor analysis to be reliable. Therefore, findings of this study should be interpreted cautiously. Apart from that, this study has provided a useful data for future studies in such areas.

Conclusion

This study showed that the PSQ is a reliable and valid instrument to identify stressors of postgraduate medical trainees. It is a promising instrument that can be used in future to explore further on this area.

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Table 1: The constructs, reliability analysis and factor analysis of PSQ.

No.	Item	Groups*	^b Factor loading	^a Corrected Item-Total Correlation	^b Cronbach's Alpha
1	Tests/examinations	A	0.440	0.210	0.63
11	Lack of time to review what have been learnt		0.402	0.330	
20	Having difficulty understanding the content		0.882	0.811	
28	Large amount of content to be learnt		0.886	0.740	
4	Lack of support from superior	S	0.818	0.666	0.84
14	Difficulty in maintaining relationship with superior		0.763	0.511	
23	My beliefs contradict with those of my superior		0.888	0.852	
26	Unfair assessment from superior		0.862	0.909	
6	Lack of authority to carry out my job duties	B	0.835	0.719	0.81
12	Unable to make full use of my skills and ability		0.622	0.464	
19	Cannot participate in decision making		0.830	0.836	
21	Having to do work outside of my competence		0.912	0.892	
2	Work demands affect my personal/home life	WF	0.808	0.590	0.65
8	Advancing a career at the expense of home/personal life		0.775	0.429	
16	My life is too centered on my work		0.869	0.539	
24	Absence of emotional support from family		0.529	0.761	
5	Working with uncooperative colleagues	C	0.733	0.562	0.73
10	Working with incompetence colleagues		0.554	0.466	
18	Relationship problems with colleagues/subordinates		0.912	0.909	
27	Competition among colleagues		0.732	0.749	

7	Time pressures and deadlines to meet	P	0.823	0.476	0.78
13	Work overload		0.902	0.511	
15	Fear of making mistakes that can lead to serious consequences		0.785	0.592	
22	My work is mentally straining		0.697	0.838	
3	Feeling insecure in this job	J	0.619	0.667	0.70
9	Society does not think highly of my profession		0.783	0.509	
17	Lack of promotion prospects		0.886	0.786	
25	Feeling of being underpaid		0.859	0.564	

*Stressor groups; **A** = Academic, **S**= Poor relationship with superior, **B** = Bureaucratic constraints, **WF** = Work-Family Conflicts, **C** = Poor relationship with colleagues, **P** = Performance pressure, **J** = Poor job prospect.

^a Factor analysis; Principal Component Analysis with rotation of Varimax. Kaiser-Meyer-Olkin Measure of Sampling Adequacy was 0.442 and Bartlett's Test of Sphericity was significant ($p < 0.001$). Total variance explained by 7 components was 84.7%.

^b Reliability analysis; Total Cronbach's alpha value of the PSQ was 0.96

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