

# Perceived Stress among Malaysian Railway Workers

Sami Abdo Radman AL-DUBAI<sup>1</sup>, Kurubaran GANASEGERAN<sup>2</sup>,  
Ramadan ELKALMI<sup>3</sup>, Mohammed ALSHAKKA<sup>4</sup>, Nizar GHANEM<sup>5</sup>

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<sup>1</sup> Faculty of Medicine, SEGI University, Jalan Teknologi, Kota Damansara, 47810 Petaling Jaya, Selangor, Malaysia

<sup>2</sup> Clinical Research Center, Seberang Jaya Hospital (HSJ), Jalan Tun Hussein Onn, 13700 Seberang Jaya, Penang, Malaysia

<sup>3</sup> Department of Pharmacy Practice, Kulliyah of Pharmacy, International Islamic University Malaysia, Jalan Sultan Ahmad Shah, Bandar Indera Mahkota, 25200 Kuantan, Pahang, Malaysia

<sup>4</sup> Department of Clinical Pharmacy, Faculty of Pharmacy, Aden University, Aden, Yemen

<sup>5</sup> Ahfad University for Women, Omdurman, Khartoum State, Sudan

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## Abstract

**Background:** Stress is a common work-related problem worldwide. Railway workers are predominantly stressed due to their rigid protocols and limited rest opportunities. This study aimed to determine the level of, and factors associated with, stress among railway workers in Malaysia.

**Methods:** A cross-sectional study was conducted among all 729 railway workers employed at Keretapi Tanah Melayu Berhad (KTMB) in eight states in Malaysia via a postal survey. The self-administered questionnaire consisted of socio-demographic characteristics and the validated Malay version of Perceived Stress Scale-10 (PSS-10). Response rate was 70.4% (513/729).

**Results:** Mean (SD) age of workers was 41.4 (10.7), with the majority aged 30 years or older (79.3%). Mean (SD) perceived stress was 18.8 (4.3). In multiple linear regression analysis, the significant predictors of high stress were high school versus tertiary education ( $\beta = 0.10$ , 95% CI 0.11, 1.73,  $P = 0.027$ ) and being a white collar worker versus blue collar ( $\beta = 0.113$ , 95% CI 0.10, 1.74,  $P = 0.010$ ).

**Conclusions:** Education level and type of work were significantly associated with perceived stress among railway workers in this study.

**Keywords:** mental health, occupational health, transportation, workers, Malaysia

## Introduction

Occupational stress refers to negatively perceived feelings that a worker experiences due to inability to cope with high job demands (1). Workers in transportation industries have higher rates of mental disorders, depression and physical health effects than workers in other occupations, including professional and managerial occupations (2–4). The railway

workers' job was classified as high-strain work based on the occupational classification theory (5).

Work-related stress among railway workers was related to important occupational stressors (whole-body vibration, awkward body posture, prolonged duties, and work environment, noise, and workers behaviours) and non-occupational stressors (improper rest, sleep disturbances) (4). Recent

studies postulated that workplace-exacerbated musculoskeletal disorders like low back pain are significantly associated with psychological stress among workers, causing substantial employee disabilities and compensations (6). These stressors substantially reduce work satisfaction and productivity, causing job absenteeism, irregular food habits, muscle aches, fatigability, easy irritability, anger, frustration and anxiety (7, 8).

Railway workers, especially locomotive engine pilots, shutters and maintenance workers were predominantly stressed due to the nature of the work, which involved rigid protocols and limited rests (9). Previous research conducted on railway workers showed that the level of perceived stress was high (1, 4, 10). This study aimed to determine the level and factors associated with perceived stress among railway workers in Malaysia.

## Methods

This study was conducted as part of the Malaysian Railway Population-Based Study (MRPBS), a population-based cross-sectional study (11). This study was conducted among all railway workers employed at the largest railway network provider in Malaysia. Railway workers were defined as those workers who belong to the Cooperative Society Keretapi Tanah Melayu Berhad (KTMB). This study recruited all 729 workers registered to the Cooperative Workers Society (KTMB). After receiving the relevant permissions from the administrative office, we obtained the respondents' postal addresses and the workers were approached through a postal survey. A self-administered questionnaire was used. In this study, 'blue-collar' worker was defined as a worker who performs manual work and 'white collar' was defined as a worker who performs work in an office (12). Approval was obtained from the affiliated institutional ethics committee. A written consent was signed by those who agreed to participate. Confidentiality and freedom to participate were assured. A total of 513 questionnaires were analysed (response rate = 70.4%).

## Instrument

### *Perceived Stress Scale (PSS-10)*

The degree to which a person perceives life as stressful is measured by the validated Malay version of the Perceived Stress Scale-10

(PSS-10). The Malay version of the Perceived Stress Scale-10 (PSS-10) features satisfying psychometric properties and a Cronbach alpha of 0.71 (13, 14). The Cronbach alpha of the PSS-10 in this study was 0.71. Each item is ranked on a 5-point Likert scale ranging from 0 (never) to 4 (very often), indicating how often they had felt stressed within the past month. The PSS-10 is not a diagnostic tool and it has no cut-off points. The total scores ranged from 0 to 40, where greater perceived stress is indicated by higher scores on the PSS-10 (14, 15).

### *Statistical analysis*

Data analyses were performed using the SPSS software; version 21.0. Descriptive analysis for socio-demographics was performed. The 10 items of the Perceived Stress Scale were added to obtain the total score (0 to 40). A test of normality of the total score of perceived stress was conducted. Cronbach's alpha was used to test the internal consistency of the scale. Student's t-test was conducted to compare the mean of perceived stress score across demographic variables. General linear regression using a 'stepwise' technique was employed to obtain factors significantly associated with perceived stress score. Variables that were significantly associated with stress in the bivariate analysis were entered in the multivariate analysis. There was no multicollinearity between the independent variables.

## Results

Socio-demographic variables are described in Table 1 (6, 11). The mean (SD) perceived stress scale was 18.8 (4.3) and the score ranged from 0.0 to 34.0. The frequencies and percentages of responses to each item of the PSS-10 are shown in Table 2. For all items, the rates of respondents answering 'never' ranged from 3.9% (item 6) to 12.5% (item 2), those answering 'sometimes' ranged from 59.1% (item 1) to 69.8% (item 10) and those answering 'very often' ranged from 1.9% (item 5) to 8.4% (item 2).

### *Associations between socio-demographics and perceived stress*

Table 1 exhibits the socio-demographic characteristics and the associations between socio-demographics and perceived stress among railway workers. Respondents who had only completed high school perceived higher

stress [mean = 19.1, SD = 3.8] when compared to respondents who graduated with a tertiary education [mean = 18.1, SD = 5.4],  $P = 0.019$ . White-collar workers perceived higher stress [mean = 19.3, SD = 4.0] in comparison to blue-collar workers [mean = 18.3, SD = 4.6],  $P = 0.007$ . Similarly, respondents who had been employed for more than 10 years perceived higher stress [mean = 19.1, SD = 4.1] when compared to junior employees [mean = 18.1, SD = 4.8],  $P = 0.011$ .

*Factors associated with perceived stress in multiple general linear regression analysis*

Table 3 shows factors associated with perceived stress among Malaysian railway workers. Respondents who had completed high school only had higher stress scores in comparison to those who graduated with a

tertiary degree ( $\beta = 0.10$ , 95% CI 0.11, 1.73,  $P = 0.027$ ). White-collar workers had a higher stress score when compared to blue-collar workers ( $\beta = 0.11$ , 95% CI 0.23, 1.74,  $P = 0.010$ ). Employment year is a significant variable but was not included in the general linear results.

**Discussion**

This study aimed to explore perceived stress among railway workers. The mean PSS score in this study was 18.8 (4.3). Previous studies reported mixed variations across different populations; with Malaysian medical and dental students reporting higher mean scores, 20.4 (4.9) and 30.4 (4.5), respectively (12, 16). Mean PSS scores amongst male and female cardiac patients exhibited lower values, 15.2 (4.4) and 16.3 (4.8) respectively (17); while the mean PSS

**Table 1:** Association between socio-demographic characteristics and perceived stress among respondents ( $n = 513$ )

Characteristics	n (%)	Mean (SD)	P-value
Gender			
Male	384 (74.9)	18.8 (4.3)	0.989
Female	129(25.1)	18.7 (4.6)	
Age group (years)			
< 30	106(20.7)	18.2 (4.1)	0.102
≥ 30	407(79.3)	19.0 (4.4)	
Education level			
High School	382(74.5)	19.1 (3.8)	0.019
Tertiary	131(25.5)	18.1 (5.4)	
Monthly income level (RM)			
< 3000	365(71.2)	18.6 (4.2)	0.150
≥ 3000	148(28.8)	19.3 (4.7)	
Occupation			
Blue-collar	246(48.0)	18.3 (4.6)	0.007
White-collar	267(52.0)	19.3 (4.0)	
Work duration (years)			
< 10	162(31.6)	18.1 (4.8)	0.011
≥ 10	351(68.4)	19.1 (4.1)	
Daily working hours			
< 9	370(72.1)	18.6 (4.0)	0.140
≥ 9	143(27.9)	19.3 (5.2)	
Work on shift			
Yes	126(24.6)	18.7 (4.6)	0.884
No	387(75.4)	18.8 (4.3)	

Student t-test was used to compare mean across variables

**Table 2:** Descriptive results of PSS-10 items

Statement	Never n (%)	Almost never n (%)	Sometimes n (%)	Fairly Often n (%)	Very Often n (%)
In the last month, how often have you been upset because of something that happened unexpectedly?	56 (10.9)	59 (11.5)	303 (59.1)	55 (10.7)	40 (7.8)
In the last month, how often have you felt that you were unable to control the important things in your life?	64 (12.5)	72 (14.0)	310 (60.4)	40 (7.8)	27 (5.3)
In the last month, how often have you felt nervous and “stressed”?	45 (8.8)	56 (10.9)	309 (60.2)	60 (11.7)	43 (8.4)
In the last month, how often have you felt confident about your ability to handle your personal problems?	40 (7.8)	102 (19.9)	326 (63.5)	32 (6.2)	13 (2.5)
In the last month, how often have you felt that things were going your way?	27 (5.3)	84 (16.4)	349 (68.0)	43 (8.4)	10 (1.9)
In the last month, how often have you found that you could not cope with all the things that you had to do?	20 (3.9)	68 (13.3)	337 (65.7)	63 (12.3)	25 (4.9)
In the last month, how often have you been able to control irritations in your life?	48 (9.4)	96 (18.7)	310 (60.4)	46 (9.0)	13 (2.5)
In the last month, how often have you felt that you were on top of things?	23 (4.5)	92 (17.9)	355 (69.2)	30 (5.8)	13 (2.5)
In the last month, how often have you been angered because of things that were outside of your control?	23 (4.5)	71 (13.8)	351 (68.4)	45 (8.8)	23 (4.5)
In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?	30 (5.8)	70 (13.6)	358 (69.8)	34 (6.6)	21 (4.1)

**Table 3:** Factors associated with perceived stress in general linear regression ( $n = 513$ )

Predictors	SE	Beta	P-value	95% CI	
				Lower	Upper
Education level					
High school vs. Tertiary education	0.5	0.10	0.027	0.11	1.73
Occupation					
Blue-collar vs. White-collar	0.4	0.11	0.010	0.23	1.74

score amongst Chinese female police officers was reported to be 15.2 (5.6) (18). The relatively inconsistent mean scores could be due to multi-variant stressors affecting psychological well-being in different populations across academic and occupational settings, or those with perceived susceptibility to chronic illnesses.

Railway workers with a high school education had significantly higher perceived stress in comparison to workers with a tertiary education. The possible explanation for this

finding may be due to reduced stress-coping skills among workers at the organisational level. Tertiary education has an important role in moulding future leaders that are globally employable, tailored and mentored to cater to the advanced needs for human workforce. Indeed, modules taught at universities and colleges emphasise organisational stress-coping mechanisms for future job demands.

White-collar workers had significantly higher perceived stress than blue-collar workers. Similar

findings were found among Slovenian railway workers (4). The hierarchical socio-economic status theory hypothesised a higher level of stress hormones to be activated when these ranks are challenged or compromised at the organisational level (4). The reduced passenger satisfaction from poor service delivered over the past decade has resulted in public criticism, causing hierarchical instability and stress among workers within the Malaysian railways industry. This catalysed a major organisational crisis, forcing the Malaysian government to call for an immediate organisational revamp and the initiation of the National Land Transportation Blueprint, with emphasis on development of sophisticated passenger-centric railway services in the near future (19). In contrast, the relatively safe and comfortable position of blue-collar workers as protected by the Malaysian Labour Act and Workers Union had limited effects on workers' stress (20).

Workers employed for more than 10 years had significantly higher perceived stress than junior workers. This finding was inconsistent with a previous study that found higher perceived stress among novice workers (21). The possible explanation for this finding may be the shift of social and supervisor support towards younger employees who require job training, as compared to older workers who have already well adapted to the nature of the work. The bulk of challenging work being assigned to more experienced workers would be another factor causing stress among these more seasoned employees. The characteristics of the non-respondents in this study is unknown, which made it difficult to determine if there is a difference between the respondent and the non-respondent group.

## Conclusion

In conclusion, education level and type of work were significantly associated with perceived stress among railway workers in this study. Workplace meritocracy, oppressive work situations and attempts to meet employer and public demands had significant associations with perceived stress. Occupational stress management techniques should be frequently taught in the workplace at the organisational level to promote effective stress coping mechanisms.

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## Conflict of Interests

None

## Fund

None

## Author's Contributions

Conception and design: SAR, KG  
Analysis and interpretation of the data: KG, RE  
Drafting of the article: KG  
Critical revision of the article for important intellectual content: SAR, RE, MA, NG  
Final approval of the article: SAR, MA, NG  
Statistical expertise: SAR, KG  
Administrative, technical, or logistic support: SAR, NG  
Collection and assembly of data: KG

## Correspondence

Professor Dr. Sami Abdo Radman Al-Dubai  
MBBS (Sana'a University),  
MPH (University of Malaya),  
DrPH (Universiti Kebangsaan Malaysia)  
Faculty of Medicine, SEGI University,  
Jalan Teknologi, Kota Damansara,  
47810 Petaling Jaya, Selangor, Malaysia  
Tel: +603 6287 3777  
Fax: +603 6145 1666  
E-mail: samidobaie@yahoo.com

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