

## Original Research Article

# Stress association with neck and shoulder pain among male taxi drivers in Shah Alam, Malaysia

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## ABSTRACT

**Background:** Drivers are often involved in events that elevate their stress levels. Drivers also experience musculoskeletal pain. The association of psychological stress with neck and shoulder pain (NSP) among drivers is not well understood. Therefore, the aim of this study is to investigate the stress associated with NSP among male taxi drivers in Shah Alam, Malaysia.

**Methods:** A cross-sectional study was conducted to explore the psychological stress associated with neck and shoulder pain among male taxi drivers aged 20 to 40 years old in Shah Alam, Malaysia. Data was collected using a self-modified questionnaire consisting of socio-demographic questions for section A, stress level questions for section B and neck and shoulder pain for section C. A total of 89 taxi drivers from Shah Alam, Malaysia were selected using convenience sampling.

**Results:** A total of 95.5% of taxi drivers experienced stress, 95.5% experienced neck pain and 50.6% experienced shoulder pain. However, the result also indicated that stress did not have an association with neck pain ( $p=0.140$ ) and shoulder pain ( $p=0.285$ ) among male taxi drivers in Shah Alam, Malaysia.

**Conclusions:** There is no association between psychological stress and neck-shoulder pain among male taxi drivers in Shah Alam, Malaysia.

**Keywords:** Stress, Neck pain, Shoulder pain, Taxi drivers, Malaysia

## INTRODUCTION

According to (Hartley and El Hassani, 1994) stress was said to be a constellation of physiological and endocrinological effects.<sup>1</sup> Drivers will not only experience stress on the road but will also experience life stress which is not related to driving at all. There are many factors that can induce life stress among drivers such as being exposed to violent behavior being lonely, social relationships, health issues and job problems.<sup>2-6</sup> Regarding stress among drivers, there are studies stating that drivers who experience unexpected natural events on

the road experience stress.<sup>7</sup> Factors such as traffic congestion, road conditions and violent acts by other drivers.<sup>8,9</sup>

Neck and shoulder pain (NSP) can also be seen among occupational drivers (ODs).<sup>10-13</sup> The presence of NSP is due to excessive use of the respective muscles.<sup>18</sup> Life factors that are related with NSP pain among drivers can be due to work or non-work-related activities workplace design health-related factors such as BMI, dietary intake, and smoking.<sup>6,14,15</sup> When it comes to driving, there are factors such as driving hours and ergonomic factor that

affect the drivers neck and shoulder area and gives rise to pain.<sup>6,16,17</sup>

When it comes to stress association with neck and shoulder pain among drivers, there are some studies stating that neck and shoulder pain are associated with stress due to heavy traffic jams vibration felt on the road, negative workplace environment, driving hours and exposure to violent behavior.<sup>8,10-12,18</sup> According to (Bovenzi, 2014; Tamrin et al, 2012) the presence of stress will directly affect the muscles due to blood flow reduction, metabolites accumulation, inflammatory response and lowered pain threshold.<sup>11,13</sup>

The main aim of current study is to find out stress level associated with NSP among male taxi drivers in Shah Alam, Malaysia.

## METHODS

### Research tools

The data was collected through a set of questionnaires which were self-conducted in the English language only. The questionnaires were also constructed by referring to previous related studies. The questionnaires consisted of three sections. Section A was about the socio-demographic data, Section B was about assessing the stress levels among taxi drivers and lastly, Section C was about assessing the presence of neck and shoulder pain among our respondents.

Section A, which was about the socio-demographic data of the respondents, was used to analyze the respondent's background. Firstly, it touched on the age where it was divided into four categories: "20 to 25 years old", "26 to 30 years old", "31 to 35 years old", and "36 to 40 years old". Secondly, it touched on races where it was also divided into four categories: "Malay", "Indian", "Chinese", and "Others". Thirdly, it touched on the educational level of these drivers where it was divided into six categories: "SPM", "Foundation", "Diploma", "Degree", "Master", and "Ph.D.". Lastly, it also touched on the driving hours per day which was divided into two categories: " $\leq 8$  hours" and " $> 8$  hours".

Section B, which was about assessing the stress levels of taxi drivers. In our study, we utilized the stress survey from the International Stress Management Association (ISMA, 2011), the United Kingdom, to give an overview of the stress levels experienced by the male taxi drivers. It consists of 25 questions such as, "I feel fatigued or tired even when I wake after an adequate sleep", "I have a tendency to eat, talk, walk and drive quickly", and "I feel irritated or angry if the car or traffic in front seems to be going too slowly/I become very frustrated at having to wait in a queue".<sup>19</sup> The questions were answered by a simple "Yes" or "No". If the respondents answered "Yes", they'll score 1 point, and if they answered "No", they'll score 0 points. Those who scored more than 4

were most likely to experience stress. Based on table 4.2, it shows that 95.5% of male taxi drivers experienced stress. Only 4 of the respondents did not experience stress with a percentage of 4.5%.

Finally, section C was about assessing the presence of neck and shoulder pain among taxi drivers. The questionnaires are constructed by referring to (Kuorinka et al, 1987).<sup>20</sup> It was divided into neck pain sections and shoulder pain sections. Both of these sections consisted of 17 questions. For the neck pain section, respondents who answered "Yes" to "Have you ever had neck trouble (ache, pain, or discomfort)?" showed that respondents were suffering from neck pain whereas for respondents who answered "Yes" to "Have you ever had shoulder trouble (ache, pain, or discomfort)?" showed that respondents were suffering from shoulder pain.

### Data collection

Questionnaires were distributed among male taxi drivers in the Shah Alam area, Malaysia. A cross-sectional study was used in our study which will be conducted among 89 male taxi drivers in the Shah Alam area. Data collection was done during November 2018.

### Data analysis

The data obtained during the research study was entered, sorted out, and was analyzed by using the Statistical Package for Social Science (SPSS) IBM (Version 25.0). According to our objectives, the data for this study was categorical hence the suitable test to be used in this research was the Chi-Square Test. Chi-Square test compares two variables to see if they are related. In this study, the stress associated with NSP among male taxi drivers in Shah Alam, Malaysia was determined.

The study was approved by the Research and Ethics Committee of Management and Science University. Consent was taken from the respondent.

## RESULTS

In this study, 89 male taxi driver respondents were approached for participation. Our research instruments-questionnaires were distributed among the participants and collected back from them.

The frequency of analysis of each socio-demographic data is shown in Table 1. In our study sample, most of the drivers were within the 20 to 25 years old age group at 73.0%. They were mostly Malaysians of Malay descent with a percentage of 57.3%. The university degree holders comprised the highest ratio at 76.4%. In terms of hours of driving per day, 80.9% of the respondents drive less than or equal to 8 hours in a day. A total of 95.5% of the respondents suffer from stress and neck pain while 50.6% suffer from shoulder pain as shown in Table 2.

**Neck and shoulder pain questionnaires**

A set of Nordic Questionnaires to measure severity, duration and frequency of neck and shoulder pain amongst our study sample were used. There is a total of 8 questions for the neck pain survey and 9 questions for the shoulder pain survey. Those who did not suffer neck or shoulder pain did not have to proceed with the rest of the questions as instructed. Our study showed that 95.5% of respondents experienced neck pain, while, 50.6% of them suffered from shoulder pain as shown in table 3.

In the neck pain survey, those who answered “No” to the first question, did not have to answer question 2 to 8,

while those who answered “0 days” to question 4, did not have to answer question 5 to 8. Based on table 4.5, only 85 respondents answered questions 2 to 4, and 71 answered questions 5 to 8. Based on the findings and the highest percentage, 76.4% did not hurt their neck in an accident, 82.0% did not change jobs because of neck pain, 58.4% suffered neck pain in a total time of 1 to 7 days during the last 12 months, 41.6% had to reduce work activity, 53.9% did not have any trouble doing leisure activity, 38.2% was prevented from doing their normal work in a total time of 1 to 7 days during the last 12 months, 68.5% did not see any doctor or physiotherapist during the last 12 months, and 44.9% did not have neck trouble at any time during the last 7 days.

**Table 1: Demographic data of respondents.**

Variable	N	%	
Age (years)	20-25	65	73.1
	26-30	14	15.7
	31-35	6	6.7
	36-40	4	4.5
Race	Malaysia	51	57.3
	Indian	2	29.2
	Chinese	5	5.6
	Others	7	7.9
Education Level	SPM (high school)	0	0
	Foundation	1	1.1
	Diploma	16	18.0
	Degree	68	76.4
	Master	4	4.5
Hours driven per day (hours)	≤8	72	80.9
	>8	17	19.1

**Table 2: Stress, neck and shoulder pain among respondents.**

Variable	N	%
<b>Stress</b>		
Most likely to suffer stress (>4)	85	95.5
Least Likely to suffer stress (≤4)	4	4.5
<b>Neck pain</b>		
No	4	4.5
Yes	85	95.5
<b>Shoulder pain</b>		
No	44	49.4
Yes	45	50.6

**Table 3: Neck and shoulder pain questionnaires.**

S. no.	Questions	N	%	
1	Have you ever had neck trouble?	No	4	4.5
		Yes	85	95.5
2	Have you ever hurt your neck in an accident?	No	68	76.4
		Yes	17	19.1
3	Have you ever had to change jobs or duties because of neck trouble?	No	73	85.9
		Yes	12	14.1

Continued.

S. no.	Questions	N	%	
4	What is the total length of time that you had neck trouble during the last 12 months?	0 days	16	18.0
		1-7 days	52	58.4
		8-30 days	15	16.9
		More than 30 days, but not every day	2	2.2
		Everyday	0	0
5	Has neck trouble caused you to reduce your activity during the last 12 months?	No	34	38.2
		Yes	37	41.6
	Work activity?	No	48	53.9
		Yes	23	
6	What is the total length of time that neck trouble has prevented you from doing your normal work during the last 12 months?	0 days	27	30.3
		1-7 days	34	38.2
		8-30 days	9	10.1
		More than 30 days	1	1.1
7	Have you been seen by a doctor, physiotherapist, chiropractor or another such person because of neck trouble during the last 12 months?	No	61	68.5
		Yes	10	11.2
8	Have you had neck trouble at any time during the last 7 days?	No	40	44.9
		Yes	31	34.8
9	Have you ever had shoulder trouble?	No	44	49.4
		Yes	45	50.6
10	Have you ever hurt your shoulder in an accident?	No	25	28.1
		Yes, my right shoulder	11	12.4
		Yes, my left shoulder	5	5.6
		Yes, both shoulders	4	4.5
11	Have you ever had to change jobs or duties because of shoulder trouble?	No	40	44.9
		Yes	5	5.6
12	Have you had shoulder trouble during the last 12 months?	No	21	23.6
		Yes, in my right shoulder	8	9.0
		Yes, in my left shoulder	2	2.2
		Yes, in both shoulders	13	14.6
13	What is the total length of time you have had shoulder trouble during the last 12 months?	1-7 days	11	12.4
		8-30 days	12	13.5
		More than 30 days, but not every day	1	1.1
		Everyday	0	0
14	Has shoulder trouble caused you to reduce your activity during the last 12 months?	No	13	14.6
		Yes	11	12.4
	Work activity?	No	14	15.7
		Yes	10	11.2
15	What is the total length of time that shoulder trouble has prevented you from doing your normal work during the last 12 months?	0 days	5	5.6
		1-7 days	10	11.2
		8-30 days	9	10.1
		More than 30 days	0	0
16	Have you been seen by a doctor, physiotherapist, chiropractor or another such person because of shoulder trouble during the last 12 months?	No	15	16.9
		Yes	9	10.1
17	Have you had shoulder trouble at any time during the last 7 days?	No	3	3.4
		Yes, in my right shoulder	6	6.7
		Yes, in my left shoulder	7	7.9
		Yes, in both shoulders	8	9.0

**Table 4: Association between neck and shoulder pain with stress among male taxi drivers in Shah Alam, Malaysia.**

	Stress				X <sup>2</sup>	P value
	Yes		No			
	N	%	N	%		
<b>Neck pain</b>						
Yes	82	96.4	3	3.6	2.180*	0.140
No	3	75.0	1	25.0		
<b>Shoulder pain</b>						
Yes	44	51.7	41	48.3	1.141*	0.285
No	1	25.0	3	75.0		

\*Fisher exact test was performed.

In the shoulder pain survey, those who answered “No” to question 9 did not have to answer questions 10 to 17, and those who answered “No” to question 12 did not have to answer questions 13 to 17. Based on table 4.6, only 45 respondents answered questions 10 to 12, and 24 answered questions 13 to 17. Based on the findings and the highest percentage, 28.1% did not hurt their shoulder in an accident, 44.9% did not have to change jobs because of shoulder trouble, 23.6% did not have shoulder trouble during the last 12 months, 13.5% suffered shoulder pain in a total time of 8 to 30 days during the last 12 months, 14.6% and 15.7% did not have any trouble doing their work activity and leisure activity respectively, 11.2% were prevented from doing their normal work in a total length time of 1 to 7 days during the last 12 months, 16.9% did not see doctor or physiotherapist during the last 12 months, and 9.0% did not have shoulder trouble at any time during the last 7 days.

As shown in Table 4, we can see that 96.4% of respondents suffered neck pain and experienced stress, 3.6% suffered from neck pain but they did not experience stress. It showed that stress did not have a significant association with neck pain among male taxi drivers in Shah Alam, Malaysia (p=0.140). It was found out that, 51.7% of respondents suffered shoulder pain and experienced stress, but stress did not have a significant association with shoulder pain among male taxi drivers in Shah Alam, Malaysia (p=0.285).

## DISCUSSION

In regard to stress among male taxi drivers in Shah Alam, Malaysia, we believed that many of our respondents have experienced stress. Other similar studies conducted on taxi drivers have confirmed the stress prevalence among taxi drivers.<sup>2,8</sup>

In our stress survey, questions like “I frequently bring work home at night”, “Not enough hours in the day to do all the things that I must do” and “I find that I don’t have time for many interests/hobbies outside of work” tells us how occupied the drivers are with their job as taxi drivers. Drivers may work hard in order to get enough payment to survive in a rapidly growing economy country like Malaysia. Questions 4 and 5 in the stress section which

states: “I do the jobs myself to ensure they are done properly” and “I underestimate how long it takes to do things” tell us that drivers can’t really expect the duration or the smoothness of the trip as they hope. It can very much mean that drivers may experience heavy traffic jams or encounter unforeseen events on the road like accidents or a car breaks down. Several studies have confirmed that all the factors above can very much make the drivers feel very stressed when they are driving.<sup>1,4,5,7,8,9</sup> In question 10, which states: “I feel fatigued or tired even when I wake after an adequate sleep” tells us that drivers often feel very tired after driving. This can very much elevate their stress level in their daily life. This can also make them feel unmotivated to drive. Insufficient sleep in a day can cause headaches and irregularity of bowel habits which was proved by other studies.<sup>5,7,8</sup> Question 11, which states: “I often nod or finish other people’s sentences for them when they speak slowly”, can tell us drivers are not focused and they will always feel the need to rush things. This can also give a negative impact on the way they drive on the road.<sup>21</sup> In question 12, which states: “I have a tendency to eat, talk, walk and drive quickly”, can tell us that drivers may feel the need to be on time or avoid being late. This can very much mean that drivers can speed drive to drop off a passenger in the designated time. It can probably be due to the pressure by the passenger to reach their destination on time.<sup>21</sup> Question 13, which states “My appetite has changed, have either a desire to binge or have a loss of appetite/may skip meals” is quite similar to questions 2 and 25. In question 14, which states: “I feel irritated or angry if the car or traffic in front seems to be going too slowly/I become very frustrated at having to wait in a queue”, tells us that heavy traffic jams are very stressful to drivers.<sup>7,8,9,21</sup> And this can be related with question 17 which states: “I experience mood swings, difficulty making decisions, concentration and memory is impaired” which shows that it can affect drivers’ concentrations when driving.<sup>22</sup> In question 22, which states “Increase in muscular aches and pains especially in the neck, head, lower back, shoulder” showed that some drivers do experience muscular aches and pain which was also confirmed in some studies.<sup>6,11,13,15</sup> Lastly, question 24, which states “I find I have a greater dependency on alcohol, caffeine, nicotine or drugs”, shows, increased uptake of caffeine or nicotine by drivers to cope with their stress. Caffeine is also taken to stay alert and focus



when driving. This can increase the alertness of drivers when driving. Studies have proved the benefits of caffeine which improves the alertness and reaction time to consumers.<sup>23</sup>

Although drivers felt stressed when driving, it does not necessarily mean that they do not know how to cope with stress. Stress does cause significant changes to the musculoskeletal system but if one knows how to handle it, it might not be associated with stress after all. Previous studies showed that 52% of drivers can cope with stress very well.<sup>8</sup> In addition to that, drivers nowadays can easily use their phone maps, or even listen to radio traffic reports to know if there is heavy traffic on the route they are taking. This can make drivers feel prepared and can plan better when driving and thus less stressed.<sup>7</sup> Furthermore, when experiencing heavy traffic jams, drivers may listen to music or songs via radio or car Bluetooth relieving the stress.<sup>24</sup> In addition to that, music was proved to be an effective anxiolytic treatment.<sup>25</sup> Talking with passengers or with someone close through Bluetooth headset also acts as a coping mechanism and can be therapeutic.<sup>26</sup> Taxi drivers also have the choice not to accept rides when they are feeling stressed. This is also one of the ways to cope with stress as taking a rest is very important to drivers and can actually reduce the chances of getting musculoskeletal pain especially neck and shoulder pain. They can take a short time to rest in between drives or can even take days off, as they are not limited by specific working hours like other jobs.

In our findings, it is shown that 95.5% of our respondents have suffered from neck pain, while, 50.6% have suffered from shoulder pain. The previous study showed that neck pain and shoulder pain complaint was reported by cab drivers and in another study by reported that 78.8% of drivers complained from neck pain while 63.5% complained of shoulder pain. Although, another study reported that those who drive more than 40 hours per week suffer more neck pain.<sup>12,11,15</sup> But, in our study, 80.9% of the drivers drive less than 8 hours a day.

Questions in the neck pain section, consist of 8 questions. Those who answered “No” to question 1 did not have to proceed with question 2 to 8 and those who answered “0 days” to question 4, did not have to proceed with question 5 to 8. Only 85 respondents have answered question 2 to 4, and 71 to question 5 to 8. In our respondents, 76.4% did not hurt their neck in an accident. This gave us a better result since those who were involved in an accident will obviously experience neck pain. This was also similar to suffering from any kind of diseases, especially bone diseases. 82.0% did not have to change jobs because of neck pain. This can tell us that, although they had neck pain, it was not severe enough to hinder their normal daily life activities. This finding can be supported by a previous study, which stated that only 12% would like to change their jobs, but there are some studies, which reported that people who suffered discomfort are more

likely to refuse to work and older drivers are most likely to look for other jobs.<sup>17,12,18</sup> In question 4, 58.4% suffered neck pain in a total time of 1 to 7 days during the last 12 months. This tells us those taxi drivers did not suffer from persistent or long-time neck pain because of the flexible working time they have as discussed earlier. In question 5(a), 41.6% had to reduce work activity. In a study performed in Nigeria, only 3.7% to 6.1% of their respondents reported reduced work activity.<sup>10</sup> Another study confirmed the activity limitation.<sup>11,17</sup> In question 5(b), 53.9% did not have any trouble doing leisure activity, whereas, in another study, 34.7% drivers who suffered neck pain had their leisure activity affected and others were prevented from doing leisure activity<sup>6,17</sup>. On the other hand, another study reported that there is no correlation between neck pain and leisure activity like sports.<sup>15</sup> Question 6, was basically to support questions 5(a) and 5(b). Only 38.2% were prevented from doing their normal work in a total time of 1 to 7 days during the last 12 months. In question 7, 68.5% did not see any doctor or physiotherapist during the last 12 months leading to the assumption that their pain was not that serious or at least tolerable and manageable. In the last question for the neck pain section, 44.9% did not have trouble at any time during the last 7 days,

For the shoulder pain section, it consists of 9 questions. Respondents who answered “No” to question 9 did not have to answer questions 10 to 17, and those who answered “No” to question 12 did not have to proceed with questions 13 to 17. Only 45 respondents answered questions 10 to 12, and 24 answered questions 13 to 17. In question 10, 28.1% did not hurt their shoulder in an accident. This also gave us the best result since those who are involved in accidents are more likely to have shoulder pain and it would interfere with the results. For question 11, 44.9% did not have to change jobs because of shoulder trouble. This is quite similar to those with neck pain who did not have to change jobs.<sup>17</sup> In question 12, 23.6% did not have a shoulder. Surprisingly, question 13 responses showed that 13.5% suffered shoulder pain in a total time of 8 to 30 days during the last 12 months. This can be due to the hard steering of the car, the distance between the seat and the steering or shoulder perching on the windows of the car.<sup>6,11,17</sup> Questions 14(a) and 14(b), 14.6% and 15.7% did not have any trouble doing their work activity and leisure activity, where the previous study reported that 31.6% of their respondents were prevented from doing their leisure activity and some studies reported shoulder trouble did prevent drivers from doing work and leisure activity.<sup>10,6,11</sup> Question 15 responses support questions 14(a) and 14(b), where only 11.2% were prevented from doing normal work in a total length time of 1 to 7 days during the last 12 months. As for Question 16, only 16.9% did not see doctor or physiotherapist during the last 12 months, which tells us that the shoulder pain the drivers had suffered was not severe and it can be treated by just resting. Lastly,

question 17, showed that only 9.0% did not have shoulder trouble at any time during the last 7 days.

Although drivers suffered from neck and shoulder pain from driving, it does not mean that they suffered it only because of driving. It can also be when drivers do another sort of activity like, sitting in front of a computer<sup>18</sup> or carrying a heavy backpack.<sup>27</sup> Sitting for a very long period of time with the hands perching on a table quite high is a risk factor for neck and shoulder pain.<sup>18</sup> Different car types and brands also play a role in neck and shoulder pain. Hard gearbox or hard steering can affect the shoulder. A hard headset can also cause neck pain.<sup>11, 17,6,13</sup> Whole-body vibration can have an effect on the shoulder and neck regions causing pain.<sup>11,13</sup> Drivers may also feel more shoulder pain if they often perch their shoulders on the car windows, drivers may also have shoulder pain due to excessive work like typing on a computer for long, or even do chores in the house or just sitting in an uncomfortable posture for a long time can cause neck pain.<sup>18,28</sup>

## CONCLUSION

In conclusion, there was no association between psychological stress and neck-shoulder pain among male taxi drivers in Shah Alam, Malaysia. More studies needed in the future with bigger samples and also include e-hailer drivers like Grab.

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