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Older Malaysian Taxi Drivers: Working Environment in the New Norm from Ergonomic Perspective

Irwan Syah Mohd Yusoff^{1,2}, Mohamad Fazli Sabri¹, Shamsul Bahri Mohd Tamrin³ & Diana Abu Ujum⁴

¹Faculty of Human Ecology, Universiti Putra Malaysia, 43400 UPM Serdang, Selangor, Malaysia, ²MyAgeing, Universiti Putra Malaysia, 43400 Serdang, Malaysia. Universiti Putra Malaysia, 43400 UPM Serdang, Selangor, ³Faculty of Medicine and Health Science, Universiti Putra Malaysia, Serdang, Malaysia. Universiti Putra Malaysia, 43400 UPM Serdang, Selangor, ⁴Faculty of Modern Languages and Communication, Universiti Putra Malaysia, 43400 UPM Serdang, Selangor.

Email: irwansyah@upm.edu.my

Abstract

Driving taxi is the alternative occupations taken up by older individuals during the COVID-19 pandemic, which can support household incomes in such challenging times. This paper aims to study the working environment among older taxi drivers in Malaysia through an ergonomic approach. A cross-sectional study was led utilizing a self-administered survey. Purposive method sampling was used based on inclusive criteria. A total of 443 respondents joined the survey. The Chi-square method was utilized to analyse the data using SPSS software version 2.0. More than half of respondents (70.0%) felt MSDs symptom injuries on their lower backs for the past 12 months and 75.4% in the last seven days. There is a significant relationship ($p < 0.05$) between variables; BMI, smoking status, carrying luggage into the trunk, feeling back pain were mainly due to the seat design and long-distance driving. Inappropriate working attitudes may cause discomfort towards developing MSDs and injuries at upper body parts. The implication of awareness programs and ergonomic approaches for work purpose might positively affect the family's well-being and the safety, and health of older Malaysian taxi drivers when adopting a new norm working environment during the Covid-19 crisis.

Keywords: Ergonomic, Older, Health and Safety, Taxi Drivers, New Norm, Malaysia

Introduction

Malaysia population is growing each year. Therefore, it is expected that the senior community may continue to work even after their retirement. The department of Social Welfare Malaysia follows an older definition based on "World Assembly on Ageing 1982" in Vienna - anyone aged 60 years and above falls under the category of elderly. Besides that, older people need specific consideration to sustain their life according to their abilities and capabilities. Therefore, older individuals share an explicit thought to sustain their life according to their capabilities and abilities in this challenging world. Past research was indicated that

approximately one-third of pensioners are vulnerable to impoverished retirement and outcomes in terms of life satisfaction and well-being (Van Solinge et al., 2008; Wang, 2007).

Along these lines, an older community may continue to work in different occupations to adapt to the new norm during Covid-19 according to their abilities or take up part-time jobs to cope with new economic challenges. The impact of COVID-19 on the world economy has been devastating. To minimize the economic impact of this pandemic, older communities find suitable jobs sector according to their ability and strength. These communities prefer be taxi drivers and the demand for this may increase based on the consideration that taxi driving a light job that is manageable, economical, energy saving and regulation free with no specific requirement (standard licensed). It is a preferred position on the off chance that drivers have experience with driving private or commercial vehicles. The Land Public Transport Commission (SPAD) data exhibits nearly 64,547 registered taxi drivers in Malaysia in 2014 (SPAD, 2016), including taxi drivers above 60 years old. These numbers continually increase during the Covid-19 phenomena.

The older taxi drivers are also exposed to fatigue from long hours of driving and bad seating postures. Moreover, car seat designs do not follow anthropometric user requirements. Those elements could be important factors that can develop a cumulative injury related to musculoskeletal disorders (MSDs), especially injuries on the lower back. Consequently, the characteristics of older taxi drivers such as the aging process makes older individuals increasingly susceptible to injuries.

From past literature, fatigue is constantly connected with a long duration of driving, and it can directly affect the driver's performance. Furthermore, it is categorized into physical and mental fatigue. Taxi drivers have a high risk of damaging the human biological clock rhythm and risk depression, fatigue, insomnia, tension, etc. (Yang et al.2014). In short, seated posture is possibly unhealthy and considered as one of the major contributing factors for several MSDs such as pain in the lower back parts (Ebe, 2001), neck (Schneider, 1989), and shoulder (Magnusson, 1996). Because of extensive exposures to seated posture in the vehicle, an appropriate sitting alteration has become a significant issue that demands adequate ergonomic interventions (Dunk, 2005). Therefore, sitting with the correct posture should be very important to avoid injuries among older taxi drivers.

Current information on comfort and discomfort has been inadequate, while the requirement for this information is crucial since individuals use items identified with comfort each day (Vink, 2012). Consideration safety for the health of older taxi drivers is vital for a better work environment and to limit the medical problems on work-related MSDs. Furthermore, it increases the health level and safety among older taxi drivers. Therefore, the primary objective of this study is to study the working characteristic among older taxi drivers in Malaysia driving the new norm through an ergonomic approach. According to the authors' best knowledge, this is the first study that was done in the context of Malaysia to assess this problem.

Materials and Methods

The cross-sectional study utilized a self-administered questionnaire to investigate the characteristics of background details and discomfort due to driving among older taxi drivers.

The survey was conducted around both the rural and urban areas in four regions of Peninsular Malaysia. The purposive sampling technique was chosen, and 443 respondents participated in the survey. The primary inclusion criteria that have been used to select the samples were subject were aged above 60 years old, had a minimum 1-year experience in taxi driving, and were registered with the SPAD. However, the drivers who had a history of major surgery or history of neurological problems, of whom had attended any course or training related to occupational health, and part-time drivers working less than 4 hours per day were excluded. Only the "Budget Car" and "Hired Car" taxi drivers were selected for the study, and they were chosen according to the distribution number of taxi licenses (refer to Table 1) and characteristics of the car itself. The car seats should be in standard seat design, and no modification was involved. Each survey took approximately 10-15 minutes to complete. The respondents were rewarded a small token of appreciation if they successfully took part in the survey-completed information related to work characteristics and some health issues. The administrative interviews were conducted with the older taxi drivers to obtain fully completed questionnaires and minimize the misinterpreted responses.

The questionnaire consisted of three sections. The initial part of the questionnaire was on socio-demographic characteristics (age, race, education level, job status, income, smoking, etc.). The second part of the questionnaire was on the background of older taxi drivers, such as total number of passengers per day, working hours per day, period of resting time per day, type of employment, number of years employed as a taxi driver, total driving distance per-week, regular starting time of driving and feelings about any back pain within the past 7 days and the last 12 months. The third part included questions on the body part discomfort level map from each body part on the sitting driving position. The questions were adapted from the United States driving ergonomics program. A body discomfort level map diagram was divided into 28 sections that are neck, upper back, middle back, left elbow, right elbow, lower back, left buttock, right buttock, left hip, right hip, left thigh, right thigh, left knee, right knee, left calf, right calf, right foot, left foot, stomach, right forearm, left forearm, right wrist, left wrist, chest, right upper arm, left upper arm, right shoulder and left shoulder. This map diagram shall assist the older taxi drivers in identifying the correct body parts in answering the questions. The questions utilized simple phrases such as "Within last week, do you feeling any discomfort with any body parts during driving (works); 1) very uncomfortable; 2) less uncomfortable; 3) uncomfortable; 4) comfortable; 5) very comfortable" and the score values begin from 1 to 5 as show in Figure 1.

1 = very uncomfortable, 2 = less uncomfortable, 3 = uncomfortable, 4 = comfortable, 5 = very comfortable

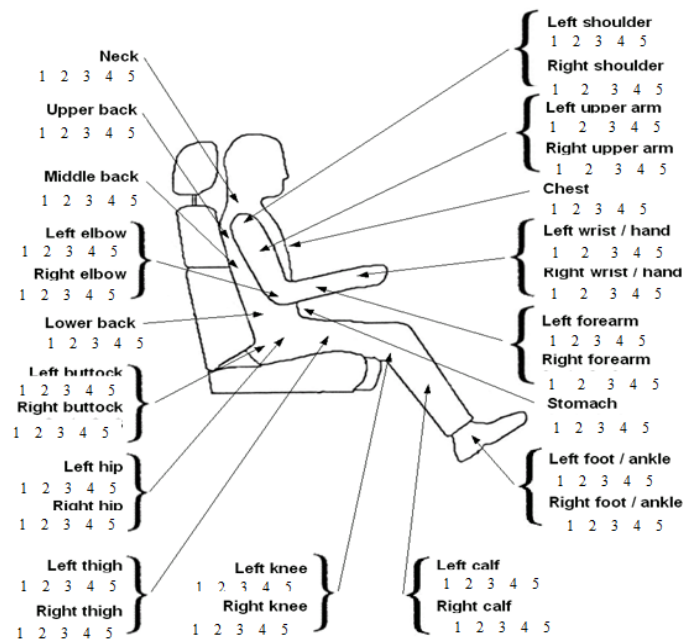


Figure 1. Mapping of the discomfort level on body parts.

The interviews were conducted at the bus stations, railway stations, taxi stations, shopping malls, business zones, rural and urban public areas, in adherence to the government standard operational procedure. According to the available statistics in the year 2016, the most highly registered types of taxis were Budget Taxi services (61.2%) and Hired Car (26.6%) with SPAD compared to other services (Table 1). These taxi types are classified as cheap taxis with standard car seat designs under the given specifications contrasted with different taxi services. The data analysis was performed utilizing SPSS software version 20. Descriptive statistics were obtained for all the variables in the study, and the Chi-Square technique was utilized.

Table 1: Number of licenses and break down of the taxi services

<i>Taxi services</i>	<i>Number of licenses</i>	<i>Percentage (%)</i>
Budget	39,505	61.2
Airport	3,135	5.0
Premier	376	0.6
Hired Car	17,224	26.6
TEKS1M	935	1.4
Executive	3,372	5.2
Total	64,547	100

Source: SPAD, 2016

Results

Socio- demographic Details of the Older Taxi Drivers

Almost all older taxi drivers were male (98.9%). The majority was Malay (68.6%) and followed by Indians (17.8%) and Chinese (13.3%). The mean age of the respondents was 66.0±3.8 years, and the age of the respondent ranged from 60 - 83-year-old. According to the BMI, 48.5% and

19.2% were overweight and obese, respectively, and only 30.9% maintained their BMI within the referenced range. The highest educational level recorded was secondary school (59.1%), followed by primary school (36.3%). The more significant portion (57.6%) of the elderly drivers were "Budget Taxi" holders, and most of the respondents (66.4%) preferred to work under a company. For the division of zones in Peninsular Malaysia, the Central Zone is the highest (45.8%), followed by the East Coast Zone (20.8%) and the Southern Zone (18.1%). Their mean monthly income was RM 2000±796.8 and ranged from RM200 to RM6000. Meanwhile, the average household was 4.0 ± 1.8 people, and more than half (66.1%) admitted to be frequent smokers' details are given in Table 2.

Tables 2: Socio-demographic of older taxi drivers

Factors	N (%)	Mean	S.D	Min.	Max.
Gender					
Male	438(98.9)				
Female	5 (1.1)				
Ethnicity					
Malay	304(68.6)				
India	79(17.8)				
Chinese	59(13.3)				
Age		66.0	3.8	60.0	83.0
60>65	220(49.7)				
>66	223(50.3)				
BMI					
Underweight	6 (1.4)				
Normal	137(30.9)				
Overweight	215(48.5)				
Obese	85(19.2)				
Education					
None	18(4.1)				
Primary school	161(36.3)				
Secondary school	262(59.1)				
University	2(0.2)				
Taxi category					
Hired car	188(42.4)				
Budget	255(57.6)				
Jobs sector					
Company	294(66.4)				
Self - employed	149(33.6)				
Zone					
East Coast	92(20.8)				
South	80(18.1)				
North	68(15.3)				
Central	203(45.8)				
Income permonth (RM)		2000.00	796.8	200	6000
Number of households		4.0	1.8	1.0	12.0
Smoking status					
Yes/frequent	293(66.1)				
No/never	150(33.9)				

(N=433)

Background Driving Details of the Older Taxi Drivers

Tabl 3 show 93.3% of driving frequency obtain by passengers per day rang from 6-10 times compared to only 6.7% more than 11 times per day. Meanwhile, 53.0% stated that they did not take a break within the week, and instead, only 47.0% took a break at least one day within the week. While 91.6% drive a taxi per day for more than 8 hours and the estimated drive in

a week for more than 56 hours is 93.7%. When categorized, almost half (45.4%) of older taxi drivers stated 2 - 3 hours of waiting time, and 29.8% was less than 1 hour to obtain passengers per day. At the same time, the remaining 24.8% answered more than 4 hours. However, 57.6% answered no nap before getting passengers, and 42.4% chose to nap. Almost all (91.4%) older taxi drivers drive more than 251.0 km in a week, and they prefer the morning (56.4%) and afternoon (32.1%) to start driving. A total of 38.1% never and 37.9% do not frequently drive until late at night. Nevertheless, there are 23.9% of older taxi drivers who regularly drive until late at night. There were complaints from older taxi drivers who experienced back pain between 12 months and one week at 70.0% and 75.4%. Almost all (94.8%) older taxi drivers agreed that the pain was due to their employment. As a result, 98.2% of older taxi drivers helped their passengers lift or load luggage into the car, and the weight of the load more than 11.0 kg (48.1%) while the second highest (40.6%) with a load between 6.0 kg-10.0 kg. The highest driving experience was 43.3% between 6.0-15.0 years, followed by 1.0-5.0 years with 36.1% and less than 20.5% over 16.0 years.

Tables 3: Background of the older taxi drivers

Factors	N (%)
Number of passengers obtain per-day	
6-10times	412(93.3)
>11times	30(6.7)
Rest taken per-week	
Yes	208(47.0)
No	235(53.0)
Total hours of driving per-day	
1-7hours	37(8.4)
>8 hours	406(91.6)
Average hours of driving per-week	
48-56 hours	28(6.3)
>56 hours	415(93.6)
Sleep/nap while waiting for the passenger	
Yes	188(42.4)
No	255(57.6)
Waiting hours per-day for passengers	
<1 hours	132(29.8)
2-3hours	201(45.4)
>4hours	110(24.8)
Average driving distance per-week	
51-150km	1(0.2)
151-250km	37(8.4)
>250km	405(91.4)
Possibility of driving until mid-night	
Always	106(23.9)
Not frequent	168(37.9)
Never	169(38.1)
Driving time	
Morning	250(56.4)

Afternoon	142(32.1)
Evening/night	27(6.1)
Anytime	24(5.4)
Feeling of back pain in last 12-month period	
Yes	310(70.0)
No	133(30.3)
Feeling of back pain in last 7 days	
Yes	334(75.4)
No	109(24.6)
Cause of the back pain due to the job	
Yes	420(94.8)
No	23(5.2)
Carrying luggage into the boot	
Yes	435(98.2)
No	8(1.8)
Loading of luggage weight	
1-5kg	42(9.5)
6-10kg	180(40.6)
>11kg	213(48.1)
Never	8 (1.8)
Total years of experience in driving	
1-5yrs	160(36.1)
6-15yrs	192(43.3)
>16yrs	91(20.5)

(N=433)

Body

parts Discomfort Level of the Older Taxi Drivers

Table 4. shows discomfort level of body parts among older taxi drivers. The highest discomfort level of MSDs was left buttock (46.5%), lower back (45.8%), right hip (44.7%), left hip (44.2%), and right buttock (39.3%) at the “less uncomfortable” level. However, the highest level was “very uncomfortable” for MSDs on the the right hip (26.9%), right back (21.7%), left-back and left hip (11.1%), and lower back (10.4%). Almost all of the upper body and lower back suffer from relatively high levels of uncomfortable MSDs; middle back (63.7%), upper back (58.5%), neck (40.2%), and left-back (33.4%). There is also an almost equal value of the percentage who experience uncomfortable levels on other body parts left knee (34.3%), right knee (33.9%), right back (31.6%), lower back (31.4%), right calf (30.5%) and left calf (30.2%). Fewer body parts that showed a “comfortable” level, and “almost none” experienced MSDs at the highest percentage were left elbow (51.0%), right thigh (50.6%), right elbow (49.4%), and left thigh (48.3%). While the majority (54.9%) of respondents agreed that the stomach part was “very comfortable” and did not experience any problems with MSDs compared to other body parts.

Tables 4: Discomfort level (MSDs) among older taxi drivers

Body parts	N (%) MSDs				
	Very uncomfortable	Less uncomfortable	Uncomfortable	Comfortable	Very comfortable
Neck	13.0(2.9)	44.0(9.9)	178.0(40.2)	132.0(29.8)	76.0(17.2)
Upper Back	15.0(3.4)	57.0(12.9)	259.0(58.5)	91.0(20.5)	21.0(4.7)
Centre Back	14.0(3.2)	65.0(14.7)	282.0(63.7)	68.0(15.3)	14.0(3.2)
Left Elbow	6.0(1.4)	16.0(3.6)	32.0(7.2)	226.0(51.0)	163.0(36.8)
Right Elbow	5.0(1.1)	19.0(4.3)	33.0(7.4)	219.0(49.4)	167.0(37.7)
Lower Back	46.0(10.4)	202.0(45.8)	139.0(31.4)	44.0(9.9)	12.0(2.7)
Left Buttock	49.0(11.1)	206.0(46.5)	148.0(33.4)	31.0(7.0)	9.0(2.0)
Right Buttock	96.0(21.7)	174.0(39.3)	140.0(31.6)	28.0(6.3)	5.0(1.1)
Left Hip	120.0(11.1)	196.0(44.2)	98.0(22.1)	27.0(6.1)	2.0(0.5)
Right Hip	119.0(26.9)	198.0(44.7)	91.0(20.5)	28.0(6.3)	7.0(1.6)
Left Thigh	17.0(3.8)	53.0(12.0)	112.0(25.3)	216.0(48.3)	47.0(10.6)
Right Thigh	8.0(1.8)	53.0(12.0)	102.0(23.0)	224.0(50.6)	56.0(12.6)
Left Knee	10.0(2.3)	42.0(9.5)	152.0(34.3)	182.0(41.1)	57.0(12.9)
Right Knee	10.0(2.3)	44.0(9.9)	150.0(33.9)	183.0(41.3)	56.0(12.6)
Left Calf	16.0(3.6)	60.0(13.5)	134.0(30.2)	164.0(37.0)	69.0(15.6)
Right Calf	17.0(3.8)	58.0(13.1)	135.0(30.5)	162.0(36.6)	71.0(16.0)
Left Shoulder	9.0(2.0)	19.0(4.3)	110.0(24.8)	165.0(37.2)	140.0(31.6)
Right Shoulder	6.0(1.4)	15.0(3.4)	114.0(25.7)	162.0(36.6)	146.0(33.0)
Left Upper Arm	6.0(1.4)	17.0(3.8)	109.0(24.6)	162.0(36.6)	149.0(33.6)
Right Upper Arm	6.0(1.4)	15.0(3.4)	83.0(18.7)	174.0(39.3)	165.0(37.2)
Chest	12.0(2.7)	7.0(1.6)	42.0(9.5)	174.0(39.3)	208.0(47.0)
Left Wrist	9.0(2.0)	19.0(4.3)	100.0(22.6)	148.0(33.4)	167.0(37.7)
Right Wrist	11.0(2.5)	22.0(5.0)	93.0(21.0)	138.0(31.2)	179.0(40.4)

Left Forearm	12.0(2.7)	21.0(4.7)	71.0(16.0)	149.0(33.6)	190.0(42.9)
Right Forearm	14.0(3.2)	16.0(3.6)	45.0(10.2)	160.0(36.1)	208.0(47.0)
Stomach	16.0(3.6)	3.0(0.7)	16.0(3.6)	165.0(37.2)	243.0(54.9)
Left Ankle	10.0(2.3)	17.0(3.8)	38.0(8.6)	194.0(43.8)	184.0(41.5)
Right Ankle	12.0(2.7)	15.0(3.4)	38.0(8.6)	192.0(43.3)	186.0(42.0)

(N=433)

Risk Factors of the Older Taxi Drivers

The results of Table 5 show that the risk factors on driving discomfort among older taxi drivers significantly correlate with respondents' BMI - $25 \geq 40$ ($X^2=6.33$, $p=0.01$) and smoking status - yes ($X^2=4.28$, $p=0.04$). Other variables like job sectors have no significant relationship with driving posture risk factors from awkward sitting. However, results of the analysis have a significant relationship with carrying luggage into the boot - yes ($X^2=12.42$, $p=0.00$), backrest support whole body - yes ($X^2=5.29$, $p=0.02$), the effect of seat size on comfortable driving - yes ($X^2=3.86$, $p=0.04$), feeling of the back pain is mainly due to the seat design and long-distance driving - yes ($X^2=4.38$, $p=0.03$) and analysis posture action score (RULA) - $3 > 4$ ($X^2=3.94$, $p=0.04$). Nevertheless, only a few variables, total hours of driving per day, driving until midnight and total driving experience in years, do not contribute to developing MSDs on driving posture risk factors from awkward sitting among older taxi drivers in Malaysia.

Tables 5: Risk factors for discomfort while driving among older taxi drivers in Malaysia

<i>Variables</i>	<i>Discomfort awkward sitting</i>		<i>Chi Square P value (X²)</i>	<i>P value</i>
	Yes (%)	No (%)		
BMI			6.33	0.01**
15 ≥ 25	30.0	0.9		
25 ≥ 40	62.3	6.8		
Job sector			0.02	0.87
Company	61.2	5.2		
Self - employed	31.2	2.5		
Smoking status			4.28	0.04**
Yes/frequent	62.3	3.8		
No/never	30.0	3.8		
Average distance of driving per-week			0.22	0.64
≤249km	8.6	0.9		
≥250km	83.7	8.7		
Total hours of driving per-day			0.30	0.59
1>7 hours	7.9	0.5		
>8 hours	84.4	7.2		
Driving until mid-night			0.91	0.77
Not frequent & never	35.0	2.7		
Always	57.3	5.0		
Carrying luggage into the boot			12.42	0.00**
Yes	91.4	7.0		
No	0.9	0.7		
Driving experience			0.69	0.40
≥5yrs	81.4	5.4		
≤4yrs	10.4	2.3		
Support of the backrest for whole body			5.29	0.02**
Yes	7.9	1.6		
No	84.4	6.1		
Effect of the seat size on comfortable driving			3.86	0.04**
No	2.5	0.7		
Yes	89.8	7.0		
Feeling of the back pain is mainly due to the seat design and long-distance driving			4.38	0.03**
Yes	91.2	7.2		
No	1.1	0.5		
Analysis posture action score (RULA)			3.94	0.04**
1>2	14.2	0.2		
3>4	78.1	7.4		

N=433

Discussion

In this study, the results have shown that most (98.9%) of the study respondents are older male taxi drivers. There are similarities with the results of the study by Wang et al (2017), Majid et al. al (2018); Yusoff et al (2020), who showed that more than 90% of taxi drivers were male. 57.6% of older taxi drivers use budget taxis, and the rest are rental taxi types. These two types of services were selected because the distribution of taxis throughout Peninsular Malaysia is the highest (SPAD, 2016). Factors of height, weight and BMI are often associated with ergonomic risk factors of MSDs among workers (Allread et al., 2004). According to Kidd et al (2000), unbalanced body muscle growth such as height and weight will lead to MSDs such as tension in nerves and muscles. From the analysis of the results, as many as 48.5% of older taxi drivers are at overweight BMI level - obese (25.0-29.9). The average monthly income of older taxi drivers is RM2000.00 ± 796.80, and this value is almost similar among taxi drivers in Addis Ababa in African countries with income less than 2000.00 (64.0%) and 2000.00-3000.00 (33.6%) (Wanamo et al., 2017). Most older taxi drivers drove taxis with a frequency of 6 > 10 times (62.8%) in a day, with the average driving within a week being 30.0 ± 13.1 times and 53.0% stating that they did not take a break within a week. This statement supports a previous study that 64.0% of taxi drivers in China who do not take a break within a month (Wang et al., 2017), and 80.3% do not take a break within a week (Ahmad et al., 2017).

Driving more than 8 hours a day is 91.6%, and the average in a week of more than 56 hours is 93.7% among older taxi drivers in Peninsular Malaysia. The result shows similarities with the study conducted by Wang et al (2017) 89.0% drive more than 8 hours a day, and 68.0% of taxi drivers work more than 12 hours a day (Ahmad et al., 2017). One of the contributing factors to lower back pain among taxi drivers is long hours driving (Majid et al. al., 2018; Yusoff et al., 2020; Yusoff et al., 2020; Ahmad et al., 2017; Wang et al., 2017; Abledu et al., 2014) and with a prevalence of 55.9% work more than 31 to 70 hours in a week (Raanaas & Anderson, 2008). According to Yang et al (2014), the average waiting time for taxi drivers in China is 3.5 hours a day. The result stated, 45.4% waiting time to obtain a passenger in a day is 2 to 3 hours, and 57.6% did not nap to obtain a passenger. Several previous studies have also shown similarities with the study results (Abledu et al., 2014; Ahmad et al., 2017; Wang et al., 2017; Yusoff et al., 2020; Yusoff et al., 2020). The majority (91.4%) of older taxi drivers drive more than 251 km of driving distance in a week. Age is one the factor for older taxi drivers to choose to start driving in the morning (56.4%) because the muscular structure is ready to accept the task and does not experience extreme fatigue, and 23.9% drive until late at night. However, USA taxi drivers are exposed to various risk factors, including driving late at night, starting operations early in the morning, working alone, and contacting the public (NIOSH, 2017). According to Wang et al. (2017), a total of 2.3 times is the probability of drivers experiencing lower back pain when driving late at night. There is a significant association with lower back pain problems among taxi drivers.

Overall, the highest prevalence of MSDs occurring in seven consecutive days of driving was in the back, and lower limbs, namely left and right hips (93.6%; 92.1%), right and left buttocks (92.0%; 91.0%), lower back (87.4 %), middle back (81.7%) and upper back (74.7%) as well as neck (53.0%). On the other hand, based on a study conducted by Ahmad et al (2017), taxi drivers in Jeddah were found to contradict the results of a study of limb MSDs in a week's driving: lower back and knees (29.4%), neck (27.4%), upper back (23.5%) and shoulders

(20.0%). There is a similarity of MSDs prevalence of a week's driving with the results of studies on the middle back limb (79.0%) and upper back of the body (65.0%) conducted by Srivastava & Kiran (2014). Overall, a total of 92.3% of older taxi drivers' complaints agreed that all MSDs problems occurred in the last 12 months and a week's driving on the limbs were due to seat design and driving posture. Previous researchers have also agreed that vehicle seat design affects driving performance and influences the comfort and physical health condition of the driver himself (Majid et al. al., 2018; Yusoff et al., 2020; Yusoff et al., 2020; Farzana, 2006). About 66.4% of older taxi drivers in Malaysia work with a company for their own and family's well-being, and similar results were previously recorded in the study by Onawumi and Lucas (2012). According to them, 85% of taxi drivers in Nigeria were employed by companies as drivers as means of living. The average income per month for an older taxi driver in Malaysia is RM 2000.00, and similar results are stated by AL- Dubai et al. in their research on "Prevalence and determinants of low back pain among taxi drivers in Malaysia" (2012).

This research also revealed no significant relationship between the drivers who work more than eight hours daily and those who drive fewer working hours due to risk factors of discomfort while driving caused by awkward sitting. However, this finding was not in line with the findings of Miyamoto et al. (2008), and according to them, driving extended periods and driving until late at night has a significant association with discomfort while driving caused by awkward sitting (Miyamoto et al., 2008). Furthermore, according to previous research, spending more time picking up and waiting for passengers daily or weekly leads to low back pain injury (Miyamoto et al., 2008). Tamrin et al (2007) revealed that the monotones in long-distance driving affected the factors like lower back pain and other injuries related to MSDs (Tamrin et al., 2007). The current study results revealed that 91.4% of the older taxi drivers who drive more than 250km per week could develop body muscle problems. Furthermore, the study found that having back pain in the past 12 months among taxi drivers in Malaysia was 70.0%, and back pain in the past seven days was 75.4%. A similar trend of results found in previous research conducted in Taiwan and Japan, and according to them, the predominance of lower back pain in the past 12 months and within seven consecutive days among taxi drivers were 45.8% and 51% respectively (Chen et al., 2005; Funakoshi et al., 2004).

Working for years as a taxi driver directly relates to the discomfort of the older drivers. The drivers with 6 - 15 years of driving experience may potentially have problems with their body parts. A previous study with professional drivers has observed a significant relationship between lower back part problems and duration of work as bus drivers (Tamrin et al., 2007). However, some previous studies on taxi drivers have found a non-significant relationship between lower back part problems and duration of employment as drivers (Chen et al., 2005). The older taxi drivers have a positive association between discomfort while driving caused by sitting awkwardly and feeling back pain because usually they carry passengers' luggage into the boot. There is a significant and positive correlation between seat measurement and anthropometric dimensions with comfortable driving, but it does not agree with the previous study led by Mohammad et al (2016). Furthermore, there was a relationship between fully supported backrest, seat size, and comfortability of driving during the career as a taxi driver. There is no significant difference in the RULA analysis posture between taxi drivers and bus drivers on action that score three on MSDs and require modifying the driving space or driving technique (Yasobant et al., 2015).

Therefore, the vast majority of the taxi drivers experience work-related diseases, have a high risk of affecting their biological clock rhythm and are at risk of body injuries, for example, low back pain, carpal tunnel syndrome, neck disorder, insomnia, depression, fatigue and tension (Yang et al., 2014). Other job-related factors, for example, whole-body vibration, cramped driving space, long working hours, total mileage, shocks due to road surface, job dissatisfaction, job stress, and experience as a taxi driver, have been observed as additional important determinants of low-back pain among taxi drivers (Bovenzi & Zadini, 1992; Chen et al., 2005; Funakoshi et al., 2004).

Conclusion

In conclusion, this research gives a concrete foundation on the characteristics of older taxi drivers, especially recognising relationships and risk factors that are important to cause injuries or pain due to their driving career in Malaysia. This is also helpful in initiating the prevention of MSDs in terms of safety and health. It identifies risk factors within the cycle of economic challenges during the COVID-19 crisis. The impact of COVID-19 forces older taxi drivers to be exposed to numerous risk factors associated with safety and health problems. This situation has also become one of the main reasons older taxi drivers have a significant relationship to various negative impacts due to the challenging environment of the new norm. The implication of awareness programs and ergonomic approaches while working might positively affect the family's well-being and the safety and health of older Malaysian taxi drivers in adopting a new working environment during the Covid-19 crisis. All government agencies or non-government bodies should play their role to ensure the well-being of the families is more secure and sustainable, especially among older taxi drivers.

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