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RELATIONSHIP BETWEEN WORK DURATION, LENGTH OF WORK, AND SLEEP DURATION WITH WORK FATIGUE AMONG ONLINE TAXI BIKE DRIVERS IN GREATER JAKARTA

HUBUNGAN DURASI KERJA, LAMA KERJA, DAN DURASI TIDUR DENGAN KELELAHAN KERJA PADA PENGENDARA OJEK ONLINE DI JABODETABEK (JAKARTA, BOGOR, DEPOK, TANGERANG, DAN BEKASI)

Original Research Article
Penelitian

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A B S T R A C T

Background: *Online taxi bike drivers were part of the road users vulnerable to accidents due to a demand that required online taxi bike drivers to work on the highway. Work duration, length of work, and sleep duration could cause the fatigue experienced by online taxi bike drivers.* ***Purpose:*** *See the strength of the relationship between work duration, length of work, and sleep duration and work fatigue among online taxi bike drivers in Greater Jakarta.* ***Method:*** *This study was observational with a cross-sectional design involving as many as 52 online taxi bike drivers selected by non-probability sampling from online taxi bike drivers in Greater Jakarta from the end of November 2022 to early December 2022.* ***Result:*** *The majority of respondents (84.6%) were under 40 years old, male (92.3%), worked more than eight hours a day (55.8%), had experience as online taxi bike drivers for more than 3 years (73.1%), sleep duration less than 8 hours (78.8%), and there were 36 online taxi bike drivers (69.2%) reported experiencing high-very high levels of fatigue. The work duration is significantly related to work fatigue (p-value = 0.002). Also, there was no significant relationship between the length of work (p-value = 0.268) and sleep duration (p-value = 0.058) with work fatigue.* ***Conclusion:*** *There was a significant relationship between work duration and work fatigue, and there was no significant relationship between the length of work and sleep duration with work fatigue. The taxi drivers with work duration >8 hours, length of work >3 years, and sleep duration <8 hours had higher risk factors for work fatigue. If a taxi bike driver works more than 8 hours daily, it is advisable to compensate with adequate rest.*

A R T I C L E I N F O

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Duration, Fatigue, Length of work, Sleep duration, Work safety

A B S T R A K

Latar belakang: Pengendara ojek online merupakan bagian dari pengguna jalan yang rentan terhadap kecelakaan, karena adanya tuntutan yang mengharuskan pengemudi ojek online untuk bekerja di jalan raya. Durasi kerja, lama kerja, dan durasi tidur dapat menjadi penyebab kelelahan yang dialami oleh pengendara ojek online. **Tujuan:** Melihat kekuatan hubungan antara durasi kerja, lama kerja, dan durasi tidur dengan kelelahan kerja pada pengendara ojek online di Jabodetabek. **Metode:** Penelitian ini bersifat observasional dengan desain studi *cross-sectional*. Sampel sebanyak 52 pengemudi ojek online, dipilih secara *non-probability* sampling di Jabodetabek pada akhir November 2022 hingga awal Desember 2022. **Hasil:** Mayoritas responden (84,6%) berusia di bawah 40 tahun, berjenis kelamin laki-laki (92,3%), bekerja lebih dari delapan jam sehari (55,8%), memiliki pengalaman sebagai pengemudi ojek online selama >3 tahun (73,1%), durasi tidur <8 jam (78,8%), dan sebanyak 36 pengemudi ojek online (69,2%) dilaporkan mengalami tingkat kelelahan tinggi-sangat tinggi. **Kesimpulan:** Terdapat hubungan signifikan antara durasi kerja dengan kelelahan kerja, dan tidak terdapat hubungan signifikan antara lama kerja dan durasi tidur dengan kelelahan kerja. Pengendara ojek online yang bekerja dengan durasi kerja >8 jam, lama kerja >3 tahun, dan durasi tidur <8 jam memiliki faktor risiko lebih tinggi untuk mendapatkan kelelahan kerja. Jika seorang tukang ojek bekerja lebih dari 8 jam per hari, disarankan untuk mengimbanginya dengan istirahat yang cukup.

Kata kunci:
Durasi, Kelelahan, Lama kerja, Durasi tidur, Keselamatan kerja

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INTRODUCTION

Work fatigue is a problem that is often found in workers. Work fatigue is an important problems that needs to be handled properly because it can cause various problems such as loss of efficiency at work, decreased productivity and work capacity, as well as health capabilities and the ability to survive the body, which causes work accidents. Fatigue is also the leading cause of work accidents and will affect productivity (Innah *et al*., 2021). Fatigue is a problem that always occurs in the workplace, both in the formal and informal sectors (Suwandi, 2022). Every year, fatigue is one of the serious causes that can cause traffic accidents (Datu *et al*., 2019).

Based on data obtained from the *World Health Organization* (WHO), around 1.3 million people die yearly due to traffic accidents globally. More than half of road traffic deaths among road users include pedestrians, cyclists, and motorcyclists (WHO, 2022). Drowsiness and fatigue in motorcycle drivers have been recognized as essential factors causing many casualties in traffic accidents (Kennedy Diema and Hayford, 2022). Meanwhile, the traffic accident data in Indonesia obtained from the Central Bureau of Statistics in 2018 reached 109.215 (BPS, 2019). Based on data from the Korlantas Polri in the same year, motorbike riders were the most significant cause of traffic accidents in Indonesia based on the type of accident, namely 56.541 cases (Korlantas Polri, 2019). In the province of Jakarta, there were 6.141 traffic accidents, of which 587 were motorcycles (BPS, 2021).

Road safety is needed to minimize accidents, including the accidents of online motorcycle taxi drivers due to driving fatigue. One thing that needs to be done for highway safety is building facilities to rest, such as rest areas. Even the provision of traffic signs is also needed so that there is no road miss information for the driver due to lack of focus due to fatigue. Clear road information will help drivers who are less focused due to fatigue to minimize road accidents. Several factors can cause high traffic accident cases in Indonesia, one of which is opening jobs in the transportation sector such as online taxi bikes (Pramesthi and Widajati, 2021). In this globalization era, online taxi bike applications have become rampant throughout Indonesian society (Kuntoro and Dini, 2020). Online taxi bike drivers are part of vulnerable road users to accidents. This could happen because online taxi bike drivers have to work every day on the road highway (Pramesthi and Widajati, 2021). Gojek is the mainstay of transportation for many people in Indonesia (Elwindra and Dokolomo, 2022). Data obtained from the official website, Gojek, shows that it started with Gojek's establishment in 2010 with 20 drivers until July 2022. Gojek has reached 2.6 million partners. Almost all of these partners are in a community named Gojek drivers (Gojek, 2023). There are already more than eight communities in the Jakarta Raya area alone.

The activities of online motorcycle taxi drivers are hectic, especially in the morning when many people who want to go to school and work need online motorcycle taxi services because they are more flexible and on time. Even during the day, the activities of online motorcycle taxi drivers are bustling due to the large number of Go-Food orders that are obtained from online motorcycle taxi consumers who want lunch at the place they want. In the afternoon, the activities of online motorcycle taxi drivers are busy with going home from school and working for the community in the city of Batam. At night, online motorcycle taxi driver activities are still jam-packed with various orders received, including Go-Food, Go-Ride, and Go-Send. One element that puts online taxi bike drivers at risk of traffic accidents is fatigue (Datu *et al*., 2019).

Fatigue in driving is very dangerous because it will cause fatal traffic accidents. Traffic accidents that occur are not only single accidents but can cause consecutive accidents that will also harm other motorists. Fatigue in online taxi bikes can be caused by several factors, including work duration, sleep duration, and work duration (Elwindra and Dokolamo, 2022). To taxi bike drivers online, lack of sleep can increase the production of stress hormones, so it causes stress and fatigue. This goes hand in hand with research conducted by Agustina and Lupita in 2019. Fatigue is a very high part of extensive experience by online taxi bike drivers who have worked for >8 hours by 52 (57.1%) respondents. The same study examining the sleep duration variable found that sleep duration is also related to fatigue in online taxi bike drivers (Lupita and Agustina, 2019).

Based on research in 2020 by Manuel and Wirawan shows that the risk of fatigue for online taxi bike drivers is caused by work stress and physical activity., With a *p-value* of 0.000, work stress is the most critical factor in online taxi bike driver fatigue. Meanwhile, the *p-value* for the physical activity variable was 0.017. This shows that online taxi bike drivers are tired, related to work stress and physical activity (Manuel and Wirawan, 2020). Stress on workers is a form of psychological feedback from the body against demands and pressures (Salim *et al*., 2019). Based on the description above, this study aims to determine the relationship between work duration, length of work, and sleep duration with work fatigue among online taxi bike drivers in Greater Jakarta.

MATERIAL AND METHOD

Study design, population, and sample

The design of this study is observational with a cross-sectional design study. The study process took place from late November to early December 2022. The number of ethical clearances of this research is No.10.122.B/KEPK-FKMUMJ/XI/2022. The research was conducted online on the Greater Jakarta online taxi bike population. In this study, the number of samples studied was 52 respondents. The sampling method of

this study uses a non-probability sampling technique. The inclusion criteria are members of the Gojek online taxi bike driver community in Greater Jakarta and are willing to be respondents. The exclusion criteria were the non-Gojek online taxi bike driver community in Greater Jakarta and those, not Whatsapp group members.

Research variable

The independent variables examined in this study were work duration, work duration, and sleep duration. The ordinal scale used to rate hours worked is divided into two categories, namely 1) >8 hours and 2) ≤8 hours. The ordinal scale used to determine the length of service is divided into two categories, namely 1) >3 years and 2) ≤3 years. The ordinal scale used to assess sleep time is divided into two categories, namely 1) <8 hours and 2) ≥8 hours.

Work fatigue is the dependent variable examined in this study. The *Subjective Questionnaire Self Ratings Test* (SSRT) from the *Japan Industrial Fatigue Research Committee* (IFRC) was used to measure work fatigue. This subjective fatigue assessment questionnaire assesses fatigue in general. It includes 30 symptoms of fatigue, which are broken down into three aspects usually experienced by online taxi bike drivers, decreased motivation, physical weakness, and weakened activity. The answers to the IFRC questionnaire are divided into four categories, and each answer is given a score or value, 1) score 4 = Very often (SS); 2) score 3 = Often (S); 3) score 2 = Sometimes; and 4) score 1 = Never (TP).

Data collection, processing, and analysis

Data was collected online using Google Forms. The Google form was distributed through personal chat and Greater Jakarta online taxi bike community groups on the Whatsapp application. Researchers processed the data collected through the editing and cleaning stages. Data analysis used the univariate test to compare the proportions of each variable and the bivariate test to see the strength of the relationship between work duration, length of work, and sleep duration with work fatigue among online taxi bike drivers in Greater Jakarta.

RESULT

Based on Table 1, information was obtained that of the 52 total respondents, most were aged ≤40 years (84.6%). Most of the sex distribution (92.3%) was male. Most respondents' working duration was >8 hours (55.8%). Some respondents have worked as online taxi bike drivers for >3 years (73.1%). Most respondents' sleep duration was <8 hours (78.8%). Adults need 7 - 8 hours of sleep each day. Doctors advise those who want to live a healthy life to apply this rule (Ministry of Health, 2018). Most respondents were at low-moderate fatigue, as many as 27 people (51.9%).

Table 1. Results of the univariate analysis

Variable	n	%
Age		
>40 years	8	15.4
≤40 years	44	84.6
Gender		
Man	48	92.3
Woman	4	7.7
Working duration		
>8 hours	29	55.8
≤8 hours	23	44.2
Length of working		
>3 years	38	73.1
≤3 years	14	26.9
Sleep duration		
<8 hours	41	78.8
≥8 hours	11	21.2
Work fatigue		
High-very high fatigue	25	48.1
Low-moderate fatigue	27	51.9

Distribution of respondents' answers regarding the work fatigue of online taxi bike drivers

Online taxi bike drivers, there are 30 questions, divided into three sub-sections of questions, each consisting of 10 questions, namely weakening of activities, weakening of motivation, and weakening of the physical (Table 2). The following are 10 questions contained in the activity attenuation section, namely feeling heavy in the head with the answers often (28.8%) and very often (19.2%); feeling tired all over the body with frequent (46.2%) and very frequent (34.6%) answers; feet feel heavy with answers often (23.1%) and very often (7.7%); often yawn when working with answers often (44.2%) and very often (42.3%); the mind feels confused with answers often (32.7%) and very often (15.4%); feeling sleepy with frequent (53.8%) and very frequent (24.6%) answers; eyes feel heavy (want to close) with answers often (34.6%) and very often (38.5%); stiff and awkward to move with frequent (21.2%) and very frequent (11.5%) answers; unbalanced in standing with answers often (26.9%) and very often (7.7%); and feel like lying down with answers often (42.3%) and very often (34.6%).

The following are 10 questions contained in the weakening of motivation section, namely finding it difficult to think with the answers often (35%) and very often (3.8%); tired of speaking with answers often (23.1%) and very often (19.2%); feel nervous about answers often (23.1%) and very often (3.8%); difficult to concentrate with frequent (36.5%) and very frequent (13.5%) answers; difficult to concentrate with answers often (26.9%) and very often (9.6%); tends to forget answers often (30.8%) and very often (21.2%); less confident with answers often (9.6%) and very often (7.7%); anxious about something with the answers often (25%) and very often (19.2%); unable to control attitude with frequent (11.5%) and very frequent (3.8%) answers; and unable to work diligently with answers often (17.3%) and very often (3.8%).

Table 2. An overview of work fatigue in online taxi bike drivers

Question	Never	Sometimes	Often	Very often
Activity weakening				
Feeling of heaviness in the head	2 (3.8%)	25 (48.1%)	15 (28.8%)	10 (19.2%)
Feeling tired all over the body	0 (0.0%)	10 (19.2%)	24 (46.2%)	18 (34.6%)
Legs feel heavy	9 (17.3%)	27 (51.9%)	12 (23.1%)	4 (7.7%)
Frequent yawning while working	0 (0.0%)	7 (13.5%)	23 (44.2%)	22 (42.3%)
Mind feels chaotic	6 (11.5%)	21 (40.4%)	1 (32.7%)	8 (15.4%)
Feeling sleepy	0 (0.0%)	6 (11.5%)	28 (53.8%)	18 (24.6%)
My eyes feel heavy (want to close them)	9 (0.0%)	14 (26.9%)	18 (34.6%)	20 (38.5%)
Stiff and awkward to move	8 (15.4%)	27 (51.9%)	11 (21.2%)	6 (11.5%)
Unbalanced in standing	10 (19.2%)	24 (46.2%)	14 (26.9%)	4 (7.7%)
Feel like lying down	3 (5.8%)	9 (17.3%)	22 (42.3%)	18 (34.6%)
Weakening of motivation				
Find it hard to think	9 (17.3%)	28 (53.8%)	13 (35%)	2 (3.8%)
Tired of talking	14 (26.9%)	16 (30.8%)	12 (23.1%)	10 (19.2%)
Feeling nervous	11 (12.2%)	27 (51.9%)	12 (23.1%)	2 (3.8%)
It's hard to concentrate	3 (5.8%)	23 (44.2%)	19 (36.5%)	7 (13.5%)
It's hard to concentrate	6 (11.5%)	2 (51.9%)	14 (26.9%)	5 (9.6%)
Tends to forget	3 (5.8%)	22 (42.3%)	16 (30.8%)	11 (21.2%)
Less confident	13 (25%)	30 (57.7%)	5 (9.6%)	4 (7.7%)
Anxious about something	5 (9.6%)	24 (46.2%)	13 (25%)	10 (19.2%)
Unable to control attitude	2 (42.3%)	22 (42.3%)	6 (11.5%)	2 (3.8%)
Unable to work diligently	21 (40.4%)	20 (38.5%)	9 (17.3%)	2 (3.8%)
Physical weakness				
Headache	2 (3.8%)	23 (44.2%)	20 (38.5%)	7 (13.5%)
Shoulders feel tight	2 (3.8%)	8 (15.4%)	30 (57.7%)	12 (23.1%)
Feeling pain in the back	1 (1.9%)	5 (9.6%)	29 (55.8%)	17 (32.7%)
Shortness of breath or difficulty breathing	28 (53.8%)	12 (23.1%)	6 (11.5%)	6 (11.5%)
Feeling thirsty	1(1.9%)	3 (5.8%)	16 (30.8%)	32 (61.5%)
Voice feels hoarse	9 (17.3%)	32 (61.5%)	4 (7.7%)	7 (13.5%)
Feeling light-headed or dizzy	1 (1.9%)	20 (38.5%)	17 (32.7%)	14 (26.9%)
The eyelids feel heavy	4 (7.7%)	24 (46.2%)	8 (15.4%)	16 (30.8%)
Trembling in certain body parts	8 (15.4%)	26 (50%)	10 (19.2%)	8 (15.4%)
Feeling unwell	6 (11.5%)	29 (55.8%)	9 (17.3%)	8 (15.4%)

The following are 10 questions in the physical weakness section, namely headaches with frequent (38.5%) and very frequent (13.5%) answers; shoulder feels stiff with frequent (57.7%) and very frequent (23.1%) answers; feel pain in the back with the answers often (55.8%) and very often (32.7%); shortness of breath or difficulty breathing with frequent (11.5%) and very frequent (11.5%) answers; feel thirsty with answers often (30.8%) and very often (61.5%); voice feels hoarse with answers often (7.7%) and very often (13.5%); feeling dizzy or dizzy with answers often (32.7%) and very often (26.9%); eyelids feel heavy with answers often (15.4%) and very often (30.8%); shaking in certain body parts with frequent (19.2%) and very frequent (15.4%) answers; and feel unwell with answers often (17.3%) and very often (15.4%).

The relationship between work duration and work fatigue

Based on Table 3, the findings of the analysis of the relationship between work duration and work fatigue in online taxi bike drivers show that 21 (72.4%) of respondents with a working duration of >8 hours experienced mild to moderate fatigue during working hours, while 6 (26.1%) Respondents with working duration ≤8 hours experienced mild to moderate fatigue during working hours. *Chi-Square* test results show a *p-value* of 0.002, which indicates a significant relationship between work duration and work fatigue in online taxi bike drivers.

The relationship between length of work and work fatigue

Based on Table 3 above, the findings of the analysis of the relationship between the length of work and work fatigue in online taxi bike drivers show that mild-moderate fatigue is experienced by 22 (57.9%) respondents with work duration >3 years, and as many as 5 (35.7%) respondents with ≤3 years of length of work. Based on the *Chi-Square* test results, which produce a *p-value* of 0.268, there is no significant relationship between the length of work and work fatigue.

The relationship between sleep duration and work fatigue

Based on Table 3 above, the analysis of the relationship between sleep duration and work fatigue in online taxi bike drivers found that 18 (43.9%) respondents experienced mild-moderate fatigue with sleep duration <8 hours, while mild-moderate fatigue. Fatigue was experienced by 9 (81.8%) respondents with sleep duration ≥8 hours. Based on the analysis, *Chi-Square* test results show a *p-value* of 0.058, indicating no significant relationship between sleep duration and work fatigue in the community of online taxi bike drivers in Greater Jakarta.

Table 3. Results of the bivariate analysis

Variable	Work fatigue level		*p-value*
	High-very high fatigue	Mild-moderate fatigue	
Work duration			
>8 hours	8 (27.6%)	21 (72.4%)	0.002
≤8 hours	17 (73.9%)	6 (26.1%)	
Length of work			
>3 years	16 (42.1%)	22 (57.9%)	0.268
≤3 years	9 (64.3%)	5 (35.7%)	
Sleep duration			
<8 hours	23 (56.1%)	18 (43.9%)	0.058
≥8 hours	2 (18.2%)	9 (81.8%)	

DISCUSSION

Work fatigue is an impact every worker obtained when doing a business or job. Work fatigue can decrease resilience and the quality and quantity of work, which can be characterized by excessive fatigue, decreased enthusiasm or motivation, and decreased activity (Salim *et al*., 2019). The results study showed that online taxi bike drivers are higher in the category of low-moderate fatigue levels, namely as many as 27 respondents (51.9%) compared to the high-very high category, with 25 respondents (48.1%).

Research shows a relationship between the fatigue experienced by online taxi bike drivers in Greater Jakarta and work duration, with a *p-value* of 0.002. This aligns with Elwindra and Dokolomo's (2022) research, which found a link between work duration and fatigue in East Jakarta online taxi bike drivers in 2020. It was acknowledged that 15 people (51.7%) out of 16 respondents reported fatigue in the group who worked more than 8 hours. According to this study, fatigue can also be caused by excessive or inappropriate working hours because it correlates with the amount of time spent working (overtime) (Elwindra and Dokolomo, 2022).

Duration of work is the accumulation of one's work activities carried out over a long time (Wardhani, 2022). Maximum working duration ranges from 8 hours per day to 40 hours per week. Energy expended in duration long and continuous work will require the muscles, lungs, cardiovascular system, and other organs to function very hard (Ihsania, 2020), with existing extension time spent by online taxi bike drivers make online taxi bike drivers experience fatigue while driving (Rahmawati, 2022). Online taxi bike drivers who work for more than 8 hours can be caused the pursuit of the desired target by online taxi bike drivers (Datu *et al*., 2019) The longer the duration of work, the more likely it is for unwanted things to happen, one of which is an accident (Tuasikal *et al*., 2020).

The study's finding about the working time variable show that as many as 38 respondents (73.1%) of online taxi bike drivers have worked for more than three years. *Chi-Square* test analysis results obtained a *p-value* of 0.268 (>0.05), indicating no relationship between the length of work and fatigue work for online taxi bike drivers. This follows Agustina and Lupita's research, which found that most participants (69.2%) had worked for less than three years (Lupita and Agustina, 2019). A statistical test using *Chi-Square* yields a score >0.05, indicating that the length of time online taxi bike drivers work in the East Jakarta area is unrelated to work fatigue (Lupita and Agustina 2019). According to Adytama and Muliawan (2020), the length of work is not related to fatigue in these workers because workers who have worked longer are more experienced and do not feel tired easily than someone who has just started working (Adytama and Muliawan, 2020).

According to Ferusgel *et al*. (2020), in a study entitled "Risk Factors of Online Taxi Bike (Online Ojek) Fatigue in Medan", stated that tenure or length of work can have both positive and negative impacts. This positive influence can occur because the longer a person works, the more experienced he is at work. This is due to physical activity that will increase power strength in the muscles of online taxi bike drivers. However, the working period can also have a negative impact, namely making workers' breathing slow. So, it will increase workers' fatigue risk (Ferusgel *et al*., 2020).

Sleep duration on online taxi drivers in Jakarta Raya was found unrelated to work fatigue. Analysis results from statistics show a *p-value* of 0.058 (>0.05). This corresponds with the findings of Effendi (2018) that online taxi bike drivers in Bekasi do not experience a correlation between sleep duration and work fatigue (Effendi, 2018). Contrary to Manuel and Wirawan's findings, respondents who slept for less than 7 hours were more likely to feel tired than online taxi bike drivers who slept usually (Manuel and Wirawan, 2020).

Car or motorbike riders will lose focus if there is a lack of sleep and body intake, such as food or body vitamins. Moreover, online motorcycle taxi drivers work continuously according to incoming orders. In line with the statement of Quamilla and Martiana (2022), who examined relationships between individual factors and work-related stress to work fatigue on the driver of a truck tank, it states that the normal time for an adult to sleep is between 7 and 8 hours per day. Drivers who slept less than that time will feel less refreshed and are more at risk of experiencing fatigue at work Quamilla and Martiana (2022). The amount of sleep duration is needed so that it can be useful for optimizing the performance of online motorcycle taxi drivers (Setyowati *et al*., 2021). Several factors could influence sleep duration, including the length of work, which causes online taxi bike drivers to need more sleep (Manuel and Wirawan, 2020).

This study has limitations, including the relatively short research duration and the limited variables studied. The sample selection in this study is non-probability sampling, so the result of this study cannot be generated for the community of taxi bike drivers in another area. Also, the online method of data collection decreased the participation rate.

CONCLUSION

Most drivers are male and aged less than or equal to 40 years old. More than half of them worked more than 8 hours daily, worked as online taxi bike drivers for more than three years, and slept less than 8 hours every day. The study found that 51.9% of online taxi bike drivers experienced low-moderate fatigue. The work duration is significantly related to work fatigue (*p-value* = 0.002). There was no relationship between the length of work and sleep duration, with work fatigue with a *p-value* = 0.268 and 0.058, respectively.

Online taxi bike drivers who have worked more than 8 hours daily to compensate for adequate rest do not push themselves while working. Drivers must check their health regularly to avoid unwanted events like work accidents. The company may strengthen the rule of work duration for taxi drivers in order for them to work proportionally.

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