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(RESEARCH ARTICLE)

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The correlation between sleep quality and anxiety level of online motorcycle taxi drivers in Semarang

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Abstract

The increasing population undoubtedly has a beneficial influence on economic growth and development. However, the considerable increase in population makes employment difficult to obtain. In this modern era, the type of work that receives a significant degree of flexibility has developed. One of them is partnering with startup companies. A startup company having influence on the population is an online motorcycle taxi. Many residents have partnered with online motorcycle taxis because of its flexibility. This flexibility is terrible for personal health, if they focus on income without managing time. In this study, the PSQI and ZSAS methods were applied to analyze the relationship between sleep quality and the level of anxiety experienced by drivers. A similar previous study was to assess the relationship with shift workers. The results showed that sleep quality had a significant relationship with anxiety levels. The figure is presented from the results of the Pearson Chi Square correlation 0.046 < 0.05. The problems arising from the causes of sleep quality and anxiety levels are health problems, work environment problems, and work problems. Therefore, the conclusion of this study is to familiarize drivers to maintain a principle of healthful life and to improve the used application system to control work and rest time management.

Keywords: Online Taxi; Driver; Quality; Sleep; Anxiety

1. Introduction

Residents in common are a social group of individuals who live in an area to carry out their life activities and are registered administratively in the area. Population development will increase because it is influenced by birth factors and the number of deaths that occur in all age groups. Population growth in each region is also influenced by immigration activities. Immigration affects the population of an area. A vast population has a beneficial impact on aspects of development and the economy (Rochaida, 2016). Both aspects have an effect on employment in Indonesia. Based on statistical data, the total workforce in February 2018 was 133.94 million people. This is formed by the number of working population and unemployed population. In 2018, there were 6.87 million people unemployed. Unemployment can disrupt economic growth in a region (Badan Pusat Statistik, 2018).

The unemployment category is someone who does not have a job, someone who will register for work and someone who is waiting for work. Unemployment is caused by the amount of labor force more than the number of jobs.In most cases the chief occupations of Indonesian society are agriculture, trade and processing industry (Badan Pusat Statistik, 2018). Yet uninvolved People in the main job will absolutely find side jobs to fulfil their economic needs. In the modern era, there are many types of recent jobs like start-ups. A startup is an institution established by a group of people designed to create recent products or services in the midst of enormous uncertainty (Ries, 2011). One of the most established startups in Indonesia is the online motorcycle taxi service. Many communities partner with online motorcycle taxi service providers. The existence of an online motorcycle taxi receives a beneficial impact on the driver.

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Drivers who receive jobs can improve the family's economy, while providers of online motorcycle taxis can ease consumers to travel to their intended destination.

Working in a startup is flexible. The flexibility of this type of work has motivated the community to partner with online motorcycle taxi providers. A driver will more deftly manage work time and other activities. Partnering with startups suffers a negative impact, especially for online motorcycle taxi drivers, for example drivers forgetting breaks during the day or total breaks, delivering orders over 15 km away and eager to achieve the target. The negative side for online motorcycle taxi drivers is the primary topic in this study. Researchers conducted a study of online motorcycle taxi drivers in the city of Semarang to assess the quality of sleep and anxiety levels experienced by them.

The study was conducted in Semarang with the object of an online motorcycle taxi driver. Researchers examined the quality of sleep and anxiety levels of the drivers. This is to find out whether most drivers have good quality sleep or just the opposite. Because online motorcycle taxi operating hours is flexible, so some drivers do work beyond normal limits and ignore total rest periods. Working extremely long without a break or merely receiving a short break will automatically affect the cognitive and sleep cycles of every driver. Human cognitive influence will cause someone to feel anxious. Anxiety caused by psychological factors is falling apart sleep and a less fit body (Anxiety And Depression Association of America, 2020). Anxiety and the influence of sleep quality will affect human concentration while performing compulsory activities like work or other activities. The object of the study was an online motorcycle taxi driver at one of the online motorcycle taxi agencies in Semarang. The agency is a transportation service provider that utilizes an online system. Services in the institution have been spread in many areas, especially in the city of Semarang. The city of Semarang is predicted to possess as many as 4,400 drivers (TribunJateng.com, 2019). Communities that partner with online motorcycle taxis achieve financial convenience, in the form of obtaining an increased fee of Rp 12,000 after wander a distance of 1-10 km. The longer the distance traveled, the greater the increased costs obtained. Online motorcycle taxi agencies additionally provide bonuses after the drivers travel as one of the motivations for getting the most work possible (Go-Jek, 2019). Work motivation and flexible operating hours will definitely affect workers to work with enthusiasm. Most drivers earn a living beyond the regulatory limit of eight hours a day. Drivers who work more than eight hours will experience fatigue and this affects driving safety as well as body health and cognitive performance (Butar-Butar, 2017). The researcher employed the Pitsburgh Sleep Quality Index Questionaire method to determine the quality of sleep of each individual after doing flexible work activities. Previous researchers employed this method to determine the effect of shift work on cognitive performance (Kazemi, et al., 2016). The researcher additionally uses the Zung Self-Rating Anxiety Scale (ZSAS) assessment method to determine the level of anxiety of drivers (Dunstan andScott, 2020). The researcher analyzed the relationship between sleep quality and anxiety levels of drivers. Finally, after analyzing the researchers provide recommendations and advice to drivers about healthy lifestyles and continuous improvement of the application system used.

2. Research method

The study was conducted in Semarang, and the object of research was online motorcycle taxi drivers. The number of online motorcycle taxi drivers in Semarang was 4,400. The sample utilized in this study comprises 366 people. In determining the number of samples, researchers adopted the Slovin formula. Here is the Slovin formula used with the application of the error value 0.5. Purposive sampling is applied as a research sampling technique (Ariola, 2006). Therefore, there are two methods used namely Pittsburgh Sleep Quality Index (PSQI) and Zung-Self Rating Anxiety Scale (ZSAS). The PSQI method is employed to assess the sleep quality of respondents. This method consists of 19 questions with 7 dimensions like subjective sleep quality, sleep latency, efficiency of sleep habits, sleep disturbance, use of sleeping pills, and dysfunction in daytime activities (Exelmans and Bulck, 2018). The PSQI questionnaire was first formulated by Daniel J. Buysse in 1989. The PSQI instrument was first used to examine sleep disorders in adults. Sleep disorders include sleepiness and disordered sleep patterns. His research shows that 15-35% of the adult population have difficulty sleeping due to the increasing number of responsibilities and workloads that must be completed (Buysse, Reynolds III, Monk, Berman, and Kupfer, 1989). The PSQI questionnaire was filled using a 0-3 Likert scale. The number 0 indicates absolutely good sleep quality. Number 1 indicates good sleep quality. Number 2 indicates poor sleep quality, and number 3 indicates extremely poor sleep quality (Manzar, et al., 2018). The ZSAS instrument consists of 20 questions to assess the level of anxiety. ZSAS was first introduced by William W.K. Chung in 1971 as a self-administered instrument. Previous research was conducted by Sylvia Ramirez and James Lukenbill who carried out psychometric analyzes to measure anxiety levels in adults with disabilities. Questionnaires were given to 136 adult people with disabilities and 96 caregivers. The study was combined with the Fear Survey, finally obtained mental retardation results of 0.40 (Ramirez and Lukenbill, 2008). How to fill in the ZSAS questionnaire using a Likert scale 1-4. The number 1 indicates never worried at all and the number 4 indicates frequent anxiety (Statistics Solution, 2020).

Because this investigation aims to determine the relationship of sleep quality and anxiety levels, the researcher employed correlational analysis. Before conducting correlational analysis, the data employed must pass the prerequisite parametric analysis tests such as normality test, linearity test, and homogeneity test.

If the data are unsuitable with one of the prerequisite tests, then the data is processed with non-parametric statistics (Noor, 2011). The data to be processed must meet the validity and reliability requirements. Therefore, the validity and reliability test of the research data were carried out. Based on the number of respondents of 366 people, the calculated r value for validity is 0.0005 with a level of confidence α = 5%. The data are declared reliable if the Cronbach's Alpha test results > 0.6. Reliability tests are shown in the following formula (Jackson, Research Methods: A Modular Approach, 2008):

$$r_{11} = \frac{n}{n-1}\left(1 - \frac{\sum_{i=1}^{n} s_i^2}{s_t^2}\right) \quad \text{..... (1)}$$

Explanation

- r11 = reliability coefficient
- n = many items
- s_i^2= score variant of the 1st question
- s_i^t= total score variance

Then the validity test is indicated by the following formula (Kurpius and Stafford, 2006):

$$r_{xy} = \frac{N(\sum XY) - (\sum X)(\sum Y)}{\sqrt{\{N\sum X^2 - (\sum X)^2\}\{N\sum Y^2 - (\sum Y)^2\}}} \quad (2)$$

Explanation

- X = score obtained from all items
- Y = total score obtained from all items
- ∑X = number of scores in the distribution X
- ∑Y = number of squares in the distribution Y
- N = number of respondents

Non-parametric statistical tests are used to present the relationship between variables, researchers adopt the Chi-Square formula. Chi-Square test is explained by the following formula (Gravetter and Wallnau, 2009):

$$X^2 = \sum \frac{(f_0 - f_e)^2}{f_e} \quad (3)$$

Explanation

- X^2 = Chi Square Value
- f_0 = Observation (frequency observed in row and column cells)
- f_e = Frequency (expected frequency in rows and columns)

Chi square test is done by properly looking at the significance value with a significance level of 5% (α = 0.05). Then to accurately determine the level of influence between variables using the Odds Ratio value from the Risk Estimate Table results in data processing using SPSS.

2.1. Case study

The study was conducted in the city of Semarang to determine the relationship between sleep quality and anxiety levels that online motorcycle taxi drivers have. Participants in the study were 366 respondents who work as online motorcycle taxi drivers. Profiles of respondents who participated in the survey are presented in Table 1.

The first stage of the researcher using the PSQI questionnaire to assess the sleep quality experienced by respondents. The results of the distribution of the PSQI questionnaire are presented in Table 2. If the global PSQI score obtained > 5, then respondents are declared to have poor sleep quality. Good sleep quality is shown from global results PSQI < 5. PSQI global score results are shown in Table 3.

Table 1 Profile of The Respondents

Characteristics of respondents		**Total**	**%**
	20-29	97	26,5%
	30-39	113	30,9%
AGES	40-49	122	33,3%
	50-59	34	9,3%
	TOTAL	366	100%
	MEN	262	71,6%
SEX TYPE	WOMEN	104	28,4%
	TOTAL	366	100%
	SINGLE	65	18%
MARITAL STATUS	MARRIED	280	77%
	WIDOW	21	6%
	TOTAL	366	100%
	YES	134	36,6%
STATUS OF SMOKING	NO	232	63,4%
	TOTAL	366	100%
	<1 YEAR	67	18,3%
OLD WORK (YEAR)	2-3 YEAR	266	72,7%
	4-5 YEAR	33	9,0%
	TOTAL	366	100%
	1-8 HOURS	96	26,2%
LONG WORK (HOURS/DAY)	9-16 HOURS	236	64,5%
	17-24 HOURS	34	9,3%
	TOTAL	366	100%
	1-30 KM	57	15,6%
TOTAL KM/DAY	31-60 KM	122	33,3%
	61-100 KM	187	51,1%
	TOTAL	366	100%
	1-2 TIMES	53	14,5%
NEW LOCATION (PER DAY)	3-4 TIMES	167	45,6%
	>5 TIMES	146	39,9%
	TOTAL	366	100%

Table 2 Respondents' Descriptive Score

Components	Category	Frequency	%
	Very Good	32	8.7%
Subjective Sleep Quality	Fairly Good	239	65.3%
	Poor	80	21.9%
	Very Bad	15	4.1%
	Score 0	51	13.9%
Sleep Latency	Score 1-2	183	50.0%
	Score 3-4	83	22.7%
	Score 5-6	46	12.6%
	> 7 Hours	50	13.7%
Sleep Duration	6-7 Hours	187	51.1%
	5-6 Hours	103	28.1%
	< 5 Hours	26	7.1%
	> 85 %	281	76.8%
Sleep Habits Efficienc	75-84 %	41	10.4%
	65-74 %	34	9.3%
	< 65 %	10	2.7%
	Score 0	19	5.2%
Sleep Disorders	Score 1-9	198	54.1%
	Score 10-18	138	37.7%
	Score 19-27	11	3.0%
	Never	287	78.4%
The Use of Sleeping Pills	< 1x a week	60	16.4%
	1-2x a week	9	2.5%
	>=3x a week	10	2.7%
	Very Good	74	20.2%
Daytime Activity Dysfunction	Good	161	44.0%
	Bad	107	29.0%
	Very Bad	24	6.5%

Table 3 shows the ultimate results of sleep quality. Most respondents who had poor sleep quality were 266 respondents.

Table 3 Distribution of Sleep Quality of Respondents

Sleep Quality	Frequency	%
Good (< 5)	100	27.32%
Poor (> 5)	266	72.68%
Total	366	100%

In connection with matters relating to poor sleep quality, the researcher summarizes several causes in the chart (Figure 1).

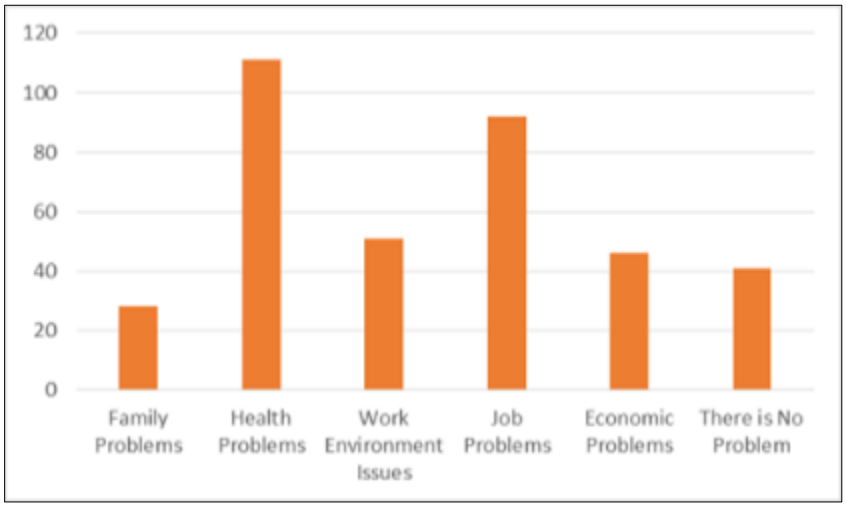

Figure 1 Sleep Quality Problems

Sleep quality problems are caused by three chief problems namely health problems, work problems, and work environment problems. The researcher invited respondents to provide solutions to that trouble. The solutions provided by the respondents are summarized in Figure 2. These solutions include entertainment activities, sleep management, and enhancing body immunity.

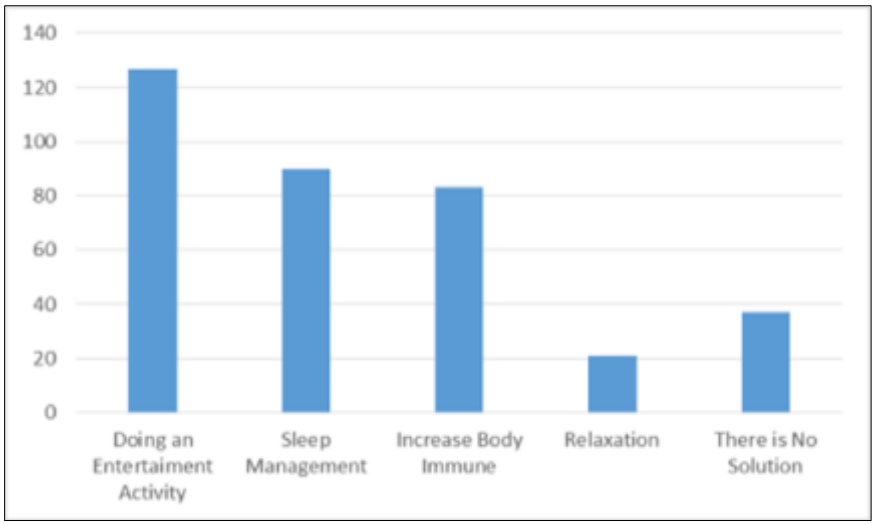

Figure 2 The Solution to Overcome Sleep Quality Problems

After recognizing the results of sleep quality, the researcher properly assessed the anxiety level of the respondents with the ZSAS questionnaire. According to the ZSAS questionnaire Anxiety level consists of three categories namely (1) Mild anxiety expressed with a global score of 20-44; (2) anxiety is being expressed with a global score of 45-59; (3) severe anxiety is adequately expressed with a global score of 60-80 (Setyowati, Chung, and Yusuf, 2019). The anxiety level of the selected respondents is succinctly summarized in Table 4. The results show the majority of drivers have a mild anxiety level of 265 people.

Table 4 Anxiety Level of Online Motorcycle Drivers

Anxiety	Frequency	%
Mild Anxiety (20-44)	265	72,4%
Moderate Anxiety (45-59)	86	23,5%
Serious Anxiety (60-80)	15	4,1%
TOTAL	366	100,0%

The researcher wanted to find out the cause of the level of mild anxiety. Therefore, she provided open-ended questions and classify what problems were factors that causing anxiety. The causes of the problem are summarized in Figure 3 which consists of three main problems namely work, work environment, and family problems.

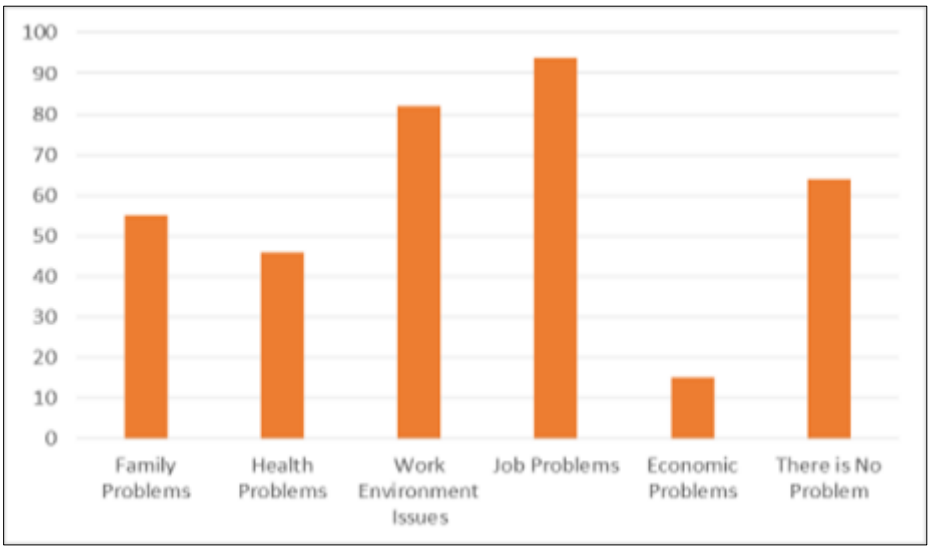

Figure 3 The Anxiety Problems

To overcome these causes of anxiety, the researcher conducted interviews with drivers. They provided a variety of ways that are summarized by researcher. Broadly speaking, the solution provided is to conduct entertainment activities, relaxation, and body's immune enhancement. The results of the solution are summarized in Figure 4.

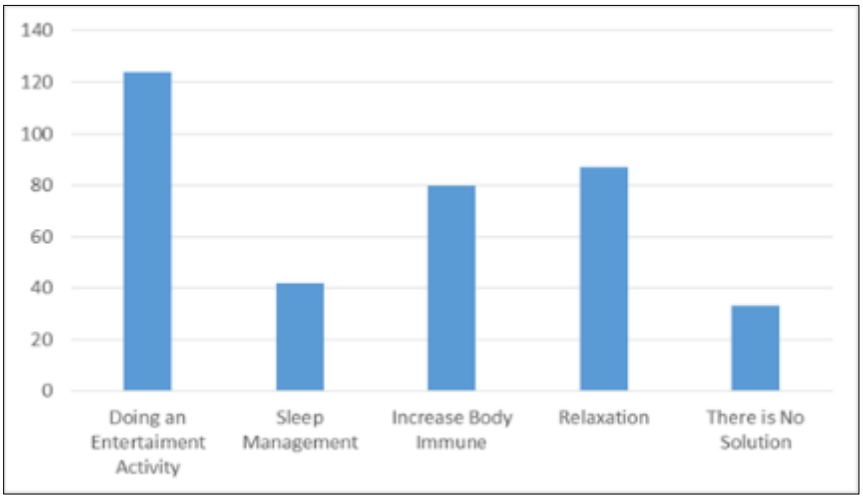

Figure 4 The Solution to Overcome Anxiety Problems

After conducting an assessment of each instrument, the researcher wanted to find out the relationship between sleep quality and anxiety levels. The first step is to conduct an analysis prerequisite test that begins with a normality test. Normality test results are stated properly distributed if the significance value > 0.05 (Usman and Akbar, 2003). The normality test shown in states the data are normally undistributed. This is because the significance value of the two variables is 0,000 < 0.05.

If the parametric statistical tests are unmet, then the data are properly obtained employing a non-parametric statistical test. Chi-Square Test was used in this study. The first step in non-parametric statistics is to know the validity of the data to be analyzed through the Case Missing analysis that indicates that there are no data missing. After it is proven that no data have been lost, the Chi-Square test can be performed.

The Chi-Square test results are shown with the following hypotheses:

- H0 = There is no significant relationship between sleep quality and anxiety level (if the significance values > 0.05
- H1 = There is a significant relationship between sleep quality and level of anxiety (if the significance value <0,05

It shows that the significance value of 0.046 < 0.05, then H0 is rejected. Therefore, it can be concluded that there is a significant relationship between the sleep quality of the motorcycle taxi drivers online with the level of anxiety they experience.

Based on the results of the Odds Ratio, a value of 1,751 with a 95% confidence level was obtained. Value 1,751 includes the numbers 1,005 to 3,051. Figures 1.751 states that respondents with good sleep quality acquire a value of 1,751 for experiencing mild anxiety.

3. Result and Discussion

Qualified sleep is a profound evening's sleep and rarely wake up in the middle of the night. When wakened it will be easy to go back to sleep without experiencing sleep disturbances (SleepFoundation.org, 2020). Factors that affect the quality of human sleep consist of lighting, shif work, jet lag, body less fit, and anxiety (Harvard Medical School, 2020). In this academic study, anxiety is one of the variables that is affected by sleep quality. Anxiety represents an emotion that is characterized by feelings of tension, anxious thoughts, and physical changes like increased blood pressure. Anxious individuals are characterized by feelings of anxiety, uncontrolled worries, increased irritability, difficulty concentrating, and difficulty sleeping (Felman, 2020). Several previous studies have examined the effect of insufficient sleep on stress (Kachikis and Breitkopf, 2012). Poor sleep quality can trigger stress. Stress can arise when someone feels anxious. Poor sleep quality that can affect anxiety levels is generally caused by lack of sleep and at the same time anxiety can affect performance (Ahrberg, Dresler, Niedermaier, Steiger, and Genzel, 2012).

This study accurately defines that sleep quality can naturally affect the level of anxiety of online motorcycle taxi drivers. This is demonstrated in the results of correlation in Table 7, there is a significant relationship between sleep quality and anxiety levels. Most of the online motorcycle taxi drivers perform their jobs flexibly, as online motorcycle taxi drivers they can work at the appropriate time without disturbing other activities. The negative side of the job is drivers are overly eager to make a profit so some drivers work outside the normal time limit. If they work outside the normal time limit, they will feel fatigued. Fatigue from drivers is merely uncaused by the number of orders that require them to deliver from one point to the next. But there are other fatigue factors like the length of time they wait for orders which results in having difficulty receiving the order. This affects the daily points or bonuses they earn. Another factor is work fatigue due to the distance per day that is too far away. This is demonstrated in Table 1. It shows that most drivers travel 61-100 km per day. When drivers find it difficult to obtain orders and experience fictitious orders, they will feel anxious. This anxiety might be caused by a problem the previous day. It was also triggered by lack of sleep needed. When experiencing difficult orders the previous day, drivers usually start working early to receive more orders, so they collect a bonus or qualify for closing points.

In this study, it can be concluded that the quality of sleep experienced by drivers is in the poor category. This needs to be addressed so that the quality of sleep owned by some drivers will be in the significant category. On average, drivers are aged between 40-49 years old, so they still have a responsibility both to meet family needs and maintain a decent life. It is recognized that poor sleep quality from most drivers accepts a mild level of anxiety. This means that most drivers have been able to minimize the level of anxiety they experience. Adequate sleep represents an ordinary effort to reduce anxiety during activities. If they carry out adequate sleep consistently, their body condition will be healthy

and fit, so that drivers can move in a healthy body condition. A fit body can minimize the level of anxiety they experience. Research recommendations are needed to improve work performance and safety in terms of application.

The specific recommendation in the health sector is the application of the CERDIK principle. CERDIK is an acronym for routine health check, get rid of cigarette smoke, Exercise regularly for at least 30 minutes, get enough rest and efficiently manage stress. Routine health checks can be done at least once every 6 months. Another suggestion is for the company to carry out routine health checks on its partners with the aim of making sure they work in good health. Next, they must get rid of cigarette smoke, based on the results of research most of the online non-smoking motorcycle taxi drivers are shown in table 4.1. The third point of the CERDIK movement is to exercise for at least 30 minutes. Before carrying out work activities, the drivers should perform 30 minutes for light exercise like warming up or stretching. It is expected that at work the drivers rest at least for light stretches, or at least 3 hours after the trip. The subsequent step is to take a rest 6-8 hours a day which is done consistently to keep the body healthy. Adequate rest can minimize anxiety before performing activities.

The ultimate point is stress management. Stress can occur due to external or internal factors. According to the results of this study, drivers can be stressed due to anxiety caused by difficult or fictitious orders. The simple steps for managing stress are among them by listening to music, performing relaxation, visualization, positive thinking, and increasing productivity. Improvements to the application system with additional features like Driving Fatigue Notification and the ability to calculate BMI (Body Mass Index) are needed. Driving Fatigue Notification can be set manually by the drivers, for example rest time after 3 hours of travel, rest time warning will appear after 3 hours of travel. The BMI calculation feature aims to correct the risk of each individual's body.

4. Conclusion

The relationship of sleep quality with the level of anxiety experienced by online motorcycle taxi drivers was assessed using the PSQI and ZSAS questionnaire instruments. Both instruments have been declared to be valid and reliable, with a PSQI reliability value of 0.697 and a ZSAS reliability of 0.892. this study shows there is a significant relationship between sleep quality and anxiety levels. This is indicated by the significance value of Pearson Chi- Square 0.046. Most drivers have poor sleep quality caused by health problems, work problems, and work environment problems. The strategies provided to overcome these obstacles are by doing entertainment activities, managing rest periods, and increasing body immunity. Based on this study the quality of sleep affects the level of anxiety of drivers, so drivers can feel anxious when sleep quality is poor. As a result of poor sleep quality, anxiety arises. The things that cause anxiety are work problems, work environment problems, and family problems. Based on the three chief problems, the drivers provide solutions to minimize anxiety by doing entertainment activities (33.88%), doing relaxation (23.77%), and increasing body immunity (21.86%).

The recommended healthy lifestyle according to the recommendation of the Central Java Provincial Health Office is follow the guiding CERDIK principle. CERDIK acronym, namely routine health checks that encourage drivers through the company to carry out routine health checks. Routine health checks aim to ensure that all drivers are in good health at work and then to get rid of cigarette smoke. Iti is related to behavior to reduce smoking because it can harm you and those around you. Based on the results of the study, most drivers already have the habit of not smoking (63%). The third principle is to be diligent in sports. There are two advices must be followed. The first health advice is to exercise before going to work or after morning wake up before carrying out household activities at least 30 minutes per day. The second advice is to have enough rest. Adequate rest can be completed by getting used to sleep patterns according to age. If the majority of drivers are 40-49 years old, the proper rest period is 6-8 hours per day. Then when working you should provide a simple rest after traveling for 3 hours. The last principle is stress management which aims to reduce the listen to relaxation music, visualize life, and always to think positively.

The experimental design published in this study was to improve the application features used by drivers with Driving Fatigue Notification. The aim is to minimize work fatigue caused by travel distance and work time used in a day. Driving fatigue notification is adopted from an automotive company in Indonesia which has a work fatigue notification feature. Other features for accurately measuring BMI (Body Mass Index) aim to enable each driver to objectively assess the body's risk.

Further research

The researcher has carefully compiled further research that can be done scientifically based on the results of the current research namely: To design and develop product design for other features charged to the application used by drivers

and to conduct extensive research on the comprehensive assessment of the quality of performance by accurately comparing other online motorcycle taxi companies that can be done in Semarang city.

Compliance with ethical standards

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Disclosure of conflict of interest

No conflict of interest to be disclosed.

Statement of ethical approval

The study involves human subjects that approved by ethical clearance from Faculty of Public Health. Dipoengoro University (Nr. 24/EA/KEPK-FKM/2025).

Statement of informed consent

Informed consent was obtained from all individual participants included in the study.

References

[1] Ahrberg, K., Dresler, M., Niedermaier, S., Steiger, A., and Genzel, L. (2012). The interaction between sleep quality and academic performance. Journal of Psychiatric Research, 46(12), 1618-1622. doi:10.1016/j/jpsychires.2012.09.008

[2] Anxiety And Depression Association of America. (2020, April 3). Sleep Disorders. Retrieved from https://adaa.org/understanding-anxiety/related-illnesses/sleep-disorders

[3] Ariola, M. M. (2006). Principles and Methods of Research. Manila: REX Book Store.

[4] Badan Pusat Statistik. (2018). Keadaan Ketenagakerjaan Indonesia Februari 2018. Jakarta: Badan Pusat Statistik. Butar-Butar, J. S. (2017). Hubungan Lama Kerja dengan Kelelahan Kerja pada Pengendara Go-Jek Community

[5] Medan Tahun 2017. Medan: Universitas Sumatera Utara.

[6] Buysse, D. J., Reynolds III, C., Monk, T. H., Berman, S., and Kupfer, D. J. (1989). The Pittsburgh Sleep Quality Index: A new instrument for psychiatric practice and research. Psychiatry Research, 28(2), 193-213. doi:10.1016/0165-1781(89)90047-4

[7] Dunstan, D. A., and Scott, N. (2020). Norms for Zung's Self-Rating Anxiety Scale. BMC Psychiatry, 20(90), 1-8. doi:https://doi.org/10,1186/s12888-019-2427-6

[8] Exelmans, L., and Bulck, J. V. (2018). Sleep Research: A Primer for Media Scholars. Health Communication, 1-10. Felman, A. (2020, April 2). What to know about anxiety. Retrieved from Medical News Today:

[9] https://www.medicalnewstoday.com/articles/323454

[10] Go-Jek. (2019, June 30). Info Skema Poin dan Bonus Baru. Retrieved from https://driver.go-jek.com/s/article/Info- Skema-Poin-dan-Bonus-Baru

[11] Gravetter, F. J., and Wallnau, L. B. (2009). Statistics for the Behavioral Sciences, Eight Edition. Belmont, USA: Wadsworth.

[12] Harvard Medical School. (2020, April 2). External Factors that Influence Sleep. Retrieved from http://healthysleep.med.harvard.edu/healthy/science/how/external-factors

[13] Jackson, S. L. (2008). Research Methods: A Modular Approach. United States of America: Thomson Wadsworth.

[14] Kachikis, A., and Breitkopf, C. (2012). Predictors of sleep characteristics among women in shouteast Texas. Women's Health Issues, 22, 99-109.

[15] Kazemi, R., Haidarmoghadam, R., Motamedzadeh, M., Golmohamadi, R., Soltanian, A., and Zoghipaydar, M. R. (2016). Effects of Shift Work on Cognitive Performance, Sleep Quality, and Sleepiness among Petrochemical Control Room Operators. Journal of Circadian Rhythms, 14(1), 1-8. doi:http://dx.doi.org/105334/jcr134

[16] Kurpius, S. E., and Stafford, M. E. (2006). Testing and Measurement: A User-Firendly Guide. Thousand Oaks: Sage Publication.

[17] Manzar, M. D., BaHamman, A., Hameed, U. A., Spence, D. W., Pandi-Perumal, S., Moscovitch, A., and Streiner, D. (2018). DImensionality of the Pittsburgh Sleep Quality Index: a systematic review. Health and Quality of Life Outcomes, 16(89), 1-22. doi:https://doi.org/10.1186/s12955-018-0915-x

[18] Noor, J. (2011). Metodologi Penelitian Skripsi, Tesis, Disertasi, and Karya Ilmiah, Edisi Pertama. Jakarta: Kencana.

[19] Ramirez, S., and Lukenbill, J. (2008). Psychometric properties of the Zung Self-Rating Anxiety Scale for Adults with intellectual disabilities (SAS-ID). Journal of Development and Physical Disabilities, 20(6), 573-580.

[20] Ries, E. (2011). The Lean Startup. New York: Fletcher and Company.

[21] Rochaida, E. (2016). Dampak Pertumbuhan Penduduk Terhadap Pertumbuhan Ekonomi dan Keluarga Sejahtera di Provinsi Kalimantan Timur. Forum Ekonomi, 14-24.

[22] Setyowati, A., Chung, M.-H., and Yusuf, A. (2019). Development of self-report assessment tool for anxiety among adolescents: Indonesian version of the Zung self-rating anxiety scale. Journal of Public Health, 10(1), 15- 18.

[23] SleepFoundation.org. (2020, April 2). Good, Fair, or Poor: How Well Do You Sleep? Retrieved from https://www.sleepfoundation.org/articles/good-fair-or-poor-how-well-do-you-sleep-0

[24] Statistics Solution. (2020, April 3). Zung Self-Rating Anxiety Scale (SAS). Retrieved from https://www.statisticssolutions.com/zung-self-rating-anxiety-scale-sas/

[25] TribunJateng.com. (2019, June 30). Jumlah Pengojek Online sudah 4.400 Orang, Supriyadi Minta Jangan Tambah Lagi. Retrieved from https://jateng.tribunnews.com/2017/03/26/jumlah-pengojek-online-sudah-4400- orang-supriyadi-minta-jangan-tambah-lagi

[26] Usman, H., and Akbar, P. S. (2003). Metodologi penelitian sosial. Jakarta: Bumi Aksara.