The Relationship Between Caffeine Consumption and The Incidence of Depression, Anxiety and Stress in Online Motorcycle Taxi Workers in Mataram City

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Abstract.

Mental health problems such as depression, anxiety, and stress are increasingly experienced by informal sector workers, including online motorcycle taxi drivers. Long working hours and high work pressure encourage high caffeine consumption to maintain alertness, which may affect mental health. This study aimed to determine the relationship between caffeine consumption and the incidence of depression, anxiety, and stress among online motorcycle taxi workers in Mataram City. This study was an observational analytic study with a cross-sectional design involving 109 online motorcycle taxi workers selected using purposive sampling. Data were analyzed using univariate and bivariate analysis with the Spearman Rho test. The results showed that most respondents had very high caffeine consumption. Depression levels were generally normal, while anxiety and stress showed moderate to high prevalence. There was no significant relationship between caffeine consumption and depression (r = 0.090; p = 0.351). However, caffeine consumption showed a significant positive relationship with anxiety (r = 0.280; p = 0.003) and stress (r = 0.523; p = 0.000). In conclusion, high caffeine consumption is associated with increased anxiety and stress, but not with depression among online motorcycle taxi workers in Mataram City.

Keywords*: Caffeine; Depression; Anxiety; Stres and Online Motorcycle Taxi Workers.*

I. INTRODUCTION

Mental health is a fundamental aspect of individual well-being which includes the ability to think rationally, manage emotions, and function optimally in social and work life. Mental health disorders, including depression, anxiety, and stress, are global health problems whose prevalence continues to increase in line with social, economic, and modern job demands (World Health Organization, 2022). This condition not only impacts the quality of life of individuals, but also contributes to a decrease in work productivity and an increase in the burden on the health system.Globally, the World Health Organization (2023) reports that more than 280 million people suffer from depression, while more than 300 million individuals live with anxiety disorders. Chronic stress is also reported to have a high prevalence and plays a major risk factor for various psychological disorders and chronic diseases (Faridah et al., 2022). In Indonesia, the prevalence of depression reaches 1.4% of the total population or around 3.9 million people, while the prevalence of stress-related mental and emotional disorders is recorded at 9.8% (Ministry of Health of the Republic of Indonesia, 2023). Data from the West Nusa Tenggara Provincial Health Office shows that Mataram City has the highest number of cases of mental health disorders in the province, indicating a significant burden of mental health problems in the region (NTB Health Office, 2024).Informal sector workers are a group that has a high vulnerability to mental health disorders due to erratic work characteristics, long working hours, and ongoing economic and psychosocial pressures.

Online motorcycle taxi drivers fall into this group, with working conditions characterized by long working durations, time pressure, and high service demands (Adelia et al., 2023). This condition has the potential to cause physical and psychological fatigue, which ultimately increases the risk of depression, anxiety, and stress.To maintain alertness and productivity while working, online motorcycle taxi drivers generally rely on the consumption of caffeinated beverages, such as coffee, tea, and energy drinks (Gautam et al., 2024). Caffeine is a central nervous system stimulant that works through the adenosine receptor antagonism mechanism, so it can improve alertness and cognitive performance in the short term (Mulyoto,

2021). Nonetheless, excessive or long-term consumption of caffeine can have negative effects, including sleep disorders, increased activity of the sympathetic nervous system, as well as the appearance of psychological symptoms such as anxiety and stress (Salsabila et al., 2023).

A number of previous studies have shown mixed results regarding the relationship between caffeine consumption and mental health disorders. Research by Unsal and Sanlier (2025) reported that high caffeine consumption (>300 mg/day) was associated with an increased risk of anxiety and stress. In contrast, the study of Nouri-Majd et al. (2022) did not find a significant association between caffeine consumption and the incidence of depression. These differences in findings are suspected to be influenced by variations in respondent characteristics, caffeine consumption patterns, and different sociodemographic factors and work environments.Until now, there has been no scientific publication that specifically examines the relationship between caffeine consumption and the incidence of depression, anxiety, and stress in online motorcycle taxi drivers in Mataram City. Given the characteristics of the workload and psychological stress typical of this group, this study is important to obtain empirical evidence on the effect of caffeine consumption on the mental health of online motorcycle taxi workers, as well as as as a basis for the development of evidence-based mental health promotive and preventive strategies.

II. METHODS

This type of study is a quantitative research with an analytical observational design using a cross-sectional approach, which aims to analyze the relationship between caffeine consumption and levels of depression, anxiety, and stress in online motorcycle taxi drivers in Mataram City. The population in this study is all online motorcycle taxi drivers operating in Mataram City, with the research sample selected using purposive sampling techniques. The inclusion criteria include online motorcycle taxi drivers who are actively working, are ≥18 years old, have worked for at least six months, and are willing to be research respondents, while the exclusion criteria include respondents with a history of psychiatric disorders who have been clinically diagnosed or are taking psychotropic drugs. The number of samples in this study is as many as [the number] of respondents.The measuring tool or instrument used to measure caffeine consumption is a structured questionnaire that includes the type of caffeinated drinks, frequency of consumption, and an estimate of the amount of caffeine consumed per day.

Levels of depression, anxiety, and stress were measured using the Depression Anxiety Stress Scale (DASS-21) instrument that has been validated and has good reliability to assess mental health conditions in the adult population. The ethical feasibility test of this research has received approval from the Medical and Health Research Ethics Committee, Faculty of Medicine, Al-Azhar Islamic University, Mataram with Ethical Feasibility Statement Number 224/EC-01/FK-06/UNIZAR/XII/2025. All respondents were given an explanation of the purpose and procedure of the research and were asked to sign a written consent sheet, with a guarantee of data confidentiality and voluntary participation.Data analysis was carried out using SPSS Version 27. Univariate analysis was used to describe respondent characteristics and distribution of study variables, while bivariate analysis was used to assess the association between caffeine consumption and levels of depression, anxiety, and stress using statistical tests that corresponded to the type and distribution of data. The level of statistical significance was set at a $p <$ value of 0.05.

III. RESULT AND DISCUSSION

Table 1. Frequency Distribution of Caffeine Consumption, Depression, Anxiety and Stress

Caffeine Consumption	**Frequency**	**Percentage (%)**
Low	1	0.9
Medium	4	3.7
Height	3	2.8
Very High	101	92.6
Depression	**Frequency**	**Percentage (%)**
Normal	58	53.2

Caffeine Consumption	**Frequency**	**Percentage (%)**
Low	1	0.9
Medium	4	3.7
Height	3	2.8
Very High	101	92.6
Lightweight	19	17.4
Medium	22	20.2
Weight	7	6.4
Very Heavy	3	2.8
Anxiety	**Frequency**	**Percentage (%)**
Normal	36	33.0
Lightweight	19	17.4
Medium	29	26.6
Weight	16	14.7
Very Heavy	9	8.3
Stress	**Frequency**	**Percentage (%)**
Normal	1	0.9
Lightweight	9	8.2
Medium	15	13.8
Weight	80	73.4
Very heavy	4	3.7
Total	109	100,0

Table 1, shows that most of the respondents have a very high level of caffeine consumption. These findings reflect the work pattern of online motorcycle taxi drivers that demand high alertness, long working hours, and the need to maintain stamina while working on the road. High caffeine consumption in this group is thought to be an adaptive strategy to overcome fatigue and drowsiness, as explained in previous research that workers with high physical and mental workloads tend to rely on caffeine as a stimulant (Gautam et al., 2024).Based on the distribution of depression levels, the majority of respondents were in the normal category, but the proportion of respondents with mild to severe depression was still significant. This shows that although most online motorcycle taxi drivers do not experience clinical depression, there are groups that are still at risk of experiencing mood disorders. Uncertain working conditions, economic pressure, and lack of social security in the informal sector are suspected to have contributed to the emergence of depressive symptoms in some respondents (Adelia et al., 2023).

The distribution of anxiety levels showed that more than half of the respondents experienced mild to very severe anxiety. These findings indicate that anxiety is a psychological problem that is quite dominant in online motorcycle taxi drivers. Time pressure, uncertainty of daily income, and direct interaction with customers and traffic have the potential to increase anxiety responses in this group of workers, as reported in several studies related to work stress in the informal sector (Faridah et al., 2022).On the stress variable, most respondents were in the category of severe stress. This condition indicates high exposure to chronic work stress in online motorcycle taxi drivers in Mataram City. Prolonged workloads, the demands of revenue targets, and the risk of traffic accidents are factors that have the potential to worsen stress levels. These findings are in line with the literature that states that high work stress in workers with long working hours and low work control can have a significant impact on mental health (McEwen, 2020).Overall, the distribution of data shows that high caffeine consumption among online motorcycle taxi drivers occurs simultaneously with a high proportion of respondents experiencing anxiety and stress, although most are still at normal levels of depression. This pattern reinforces the importance of further research on the relationship between caffeine consumption and mental health conditions, particularly in groups of online motorcycle taxi workers who have typical characteristics of workload and psychological distress.

Table 2. Analysis of the Relationship between Caffeine Consumption and Depression

Caffeine Consumption	Depression												p-value	R2
	Normal		Lightweight		Medium		Weight		Very Heavy		Total			
	n	%	n	%	N	%	n	%	n	%	n	%		
Low	**1**	**100.0**	**0**	**0.0**	**0**	**0.0**	**0**	**0.0**	**0**	**0.0**	**1**	**100.0**	**0.351**	**0.090**
Medium	**3**	**75.0**	**0**	**0.0**	**1**	**25.0**	**0**	**0.00**	**0**	**0.0**	**4**	**100.0**		
Height	**2**	**66.7**	**0**	**0.0**	**0**	**0.0**	**1**	**33.3**	**0**	**0.0**	**3**	**100.0**		
Very High	**52**	**51.5**	**19**	**18.8**	**21**	**20.8**	**6**	**5.9**	**3**	**3.0**	**101**	**100.0**		
Total	**58**	**53.2**	**19**	**17.4**	**22**	**20.2**	**7**	**6.4**	**3**	**2.8**	**109**	**100.0**		

Table 2, shows that the relationship between caffeine consumption and depression levels in 109 respondents, most of the respondents with very high caffeine consumption were in the normal depression category. However, in the group with very high caffeine consumption, respondents with mild to very severe depression were still found in a small proportion. In the high and moderate caffeine consumption group, most respondents were also in the normal depression category, with a relatively limited number of respondents experiencing depression. The results of the Spearman correlation test showed a correlation coefficient of 0.090 which indicated a very weak positive relationship between caffeine consumption and depression levels. Statistical tests showed a ρ-value of 0.351 ($\rho > 0.05$), so it can be concluded that there is no statistically significant relationship between caffeine consumption and depression levels.

Table 3. Analysis of the Relationship between Caffeine Consumption and Anxiety

Caffeine Consumption	Anxiety												p-value	R2
	Normal		Lightweight		Medium		Weight		Very Heavy		Total			
	n	%	n	%	n	%	n	%	n	%	n	%		
Low	1	100.0	0	0.0	0	0.0	0	0.0	0	0.0	1	100.0	0.003	0.280
Medium	4	100.0	0	0.0	0	0.0	0	0.0	0	0.0	4	100.0		
Height	2	66.7	0	0.0	1	33.3	0	0.0	0	0.0	3	100.0		
Very High	29	28.7	19	18.8	28	27.7	16	15.8	9	8.9	101	100.0		
Total	36	33.0	19	17.4	29	26.6	16	14.7	9	8.3	109	100.0		

Table 3, shows that the relationship between caffeine consumption and anxiety levels in 109 respondents shows a tendency to increase anxiety levels along with increased caffeine consumption. Most of the respondents with very high caffeine consumption experienced anxiety in the mild to very severe category, although there were still respondents in this group who were in the normal anxiety category. In the high caffeine consumption group, most respondents were in the normal anxiety category, while in the moderate and low caffeine consumption groups, respondents tended not to experience anxiety. The results of the Spearman correlation test showed a correlation coefficient of 0.280 which indicated a positive association with weak strength between caffeine consumption and anxiety levels. Statistical tests showed a ρ-value of 0.003 ($\rho < 0.05$), so it can be concluded that there is a statistically significant relationship between caffeine consumption and anxiety levels.

Table 4. Analysis of the Relationship between Caffeine Consumption and Stress

Caffeine Consumption	Stress												p-value	R2
	Normal		Lightweight		Medium		Weight		Very Heavy		Total			
	n	%	n	%	n	%	n	%	n	%	n	%		
Low	1	100.0	0	0.0	0	0.0	0	0.0	0	0.0	1	100.0	0.000	0.523
Medium	0	0.0	4	100.0	0	0.0	0	0.0	0	0.0	4	100.0		
Height	0	0.0	0	0.0	3	100.0	0	0.0	0	0.0	3	100.0		
Very High	0	0.0	5	5.0	12	11.9	80	79.2	4	4.0	101	100.0		
Total	1	0.9	9	8.3	15	13.8	80	73.4	4	3.7	109	100.0		

Table 4 shows that the relationship between caffeine consumption and stress levels in 109 respondents shows a tendency to increase stress levels along with increased caffeine consumption. In the group of respondents with very high caffeine consumption, most were in the category of severe to very severe stress, and no respondents were found in the category without stress. Meanwhile, in the high and moderate caffeine consumption group, respondents' stress levels tended to be lower, and in the low caffeine consumption group, all respondents were in the no-stress category. The results of the Spearman correlation test showed a correlation coefficient of 0.573 which indicated a positive and moderate relationship between caffeine consumption and stress levels. Statistical tests showed a ρ-value of 0.000 ($\rho < 0.05$), so it can be concluded that there is a statistically significant relationship between caffeine consumption and stress levels.

Discussion

The Relationship between Caffeine Consumption and the Incidence of Depression

The results of the study showed that caffeine consumption did not have a statistically significant relationship with the level of depression in online motorcycle taxi drivers in Mataram City. Spearman correlation test yields value ρ-value by 0.351 ($\rho > 0.05$) with a correlation coefficient of 0.090, which indicates a positive relationship with very weak strength. These findings indicate that increased caffeine consumption was not significantly followed by increased levels of depression in respondents.Most of the respondents with very high caffeine consumption were in the normal depression category, although a small number of respondents were still found with mild to very severe depression. This condition can be explained because depression is a multifactorial mental disorder and is influenced by various psychosocial factors such as economic stress, social support, workload, and individual health conditions, which are not always directly related to caffeine consumption (American Psychiatric Association, 2022; WHO, 2022).Biologically, caffeine acts as an adenosine receptor antagonist which in low to moderate doses can improve alertness and mood, so it does not always trigger depressive symptoms, especially in individuals who have become accustomed to consuming caffeine for the long term (Mulyoto, 2021; Nouri-Majd et al., 2022). The study's findings are in line with several previous studies that reported no significant association between caffeine consumption and the incidence of depression in adult populations (Nouri-Majd et al., 2022).

The Relationship of Caffeine Consumption with Anxiety Events

The results of the study showed that caffeine consumption had a statistically significant relationship with the level of anxiety in online motorcycle taxi drivers. The Spearman correlation test showed a ρ-value of 0.003 ($\rho < 0.05$) with a correlation coefficient of 0.280, indicating a positive relationship with weak strength. This means that the higher the caffeine consumption, the tendency for anxiety levels also increases. Most respondents with very high caffeine consumption were in the category of mild to very severe anxiety. This can be influenced by the characteristics of online motorcycle taxi drivers' jobs that demand high alertness, time pressure, and income uncertainty, so that excessive caffeine consumption has the potential to worsen existing anxiety responses (Faridah et al., 2022; Gautam et al., 2024).Physiologically, caffeine consumption can increase the activity of the sympathetic nervous system through increased release of catecholamines such as adrenaline and noradrenaline, which trigger anxiety symptoms in the form of restlessness, palpitations, and muscle tension (Salsabila et al., 2023; Sadock et al., 2021). These findings are in line with the study of Unsal and Sanlier (2025) which reported that high dose caffeine consumption was significantly associated with increased anxiety, although the strength of the relationship tended to be weak.

The Relationship of Caffeine Consumption with Stress Levels

The results of the study showed that caffeine consumption had a statistically significant relationship with the level of stress in online motorcycle taxi drivers. The Spearman correlation test yielded a ρ-value value of 0.000 ($\rho < 0.05$) with a correlation coefficient of 0.573, indicating a positive relationship with moderate strength. These findings suggest that increased caffeine consumption is followed by a consistent increase in stress levels.Most of the respondents with very high caffeine consumption were in the severe to very severe stress category, and no stress-free respondents were found in this group. This condition reflects the high workload and psychological pressure on online motorcycle taxi drivers, where caffeine consumption is often used as a stimulant to maintain work performance, but has the potential to aggravate the stress response (Gautam et al., 2024).Pathophysiologically, high doses of caffeine can increase the activation of the

sympathetic nervous system and the hypothalamic–pituitary–adrenal (HPA) axis, which triggers increased cortisol and adrenaline levels. Repeated activation of these systems can lead to persistent physiological stress, especially in individuals with chronic occupational stress exposure (McEwen, 2020; Steptoe & Kivimäki, 2021). These findings are in line with previous research that reported a significant association between excessive caffeine consumption and increased work stress in workers with high work demands (Unsal & Sanlier, 2025).

IV. CONCLUSION

This study provides an overview that caffeine consumption plays a role in mental health conditions, especially in the aspects of anxiety and stress, while its relationship with depression does not show a meaningful relationship. These findings suggest that the impact of caffeine consumption on psychological conditions is selective and does not necessarily affect all dimensions of mental health uniformly. High caffeine consumption tends to be associated with increased physiological and psychological responses related to anxiety and stress, indicating that caffeine may play a role as a triggering factor or aggravating factor in individuals with a high activity load and psychosocial stress. In contrast, depression appears to be more influenced by other factors outside of caffeine consumption, such as psychosocial, environmental, and individual characteristics. Overall, this study confirms that caffeine consumption is a factor that needs to be considered in efforts to maintain mental health, especially related to stress and anxiety management. These results emphasize the importance of a promotive and preventive approach that focuses not only on restricting caffeine consumption, but also on stress management, improving sleep quality, as well as improving the balance between work demands and individual adaptive capacity.

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