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# Analysis of Factors Related to *Safety Riding* in Employees of the Karangmalang Health Center in Semarang City in 2025.

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**ABSTRACT**

Traffic accidents are still a public health problem, especially for motorcycle users in the productive age group. This study aims to analyze factors related to *safety riding* behavior in employees of the Karangmalang Health Center in Semarang City. This study is a quantitative analysis with *a cross-sectional* design on 45 respondents who were taken in total sampling. Independent variables include age, working period, use of PPE, road environmental conditions, and family support, while dependent variables are *safety riding* behavior. Data were collected using a questionnaire and analyzed with a Spearman Rank test at $\alpha < 0.05$. The results showed that 53.3% of respondents had good *safety riding* behavior. There was a significant association between age ($p = 0.027$; $r = -0.329$), road environmental conditions ($p = 0.017$; $r = 0.353$), and family support ($p < 0.001$; $r = 0.542$) and *safety riding* behavior, while working period ($p = 0.560$) and PPE use ($p = 0.089$) were not significantly related. The conclusion of this study is that age, road environmental conditions, and family support are related to *safety riding* behavior, while working period and PPE use are not related, so it is recommended to improve driving safety education, strengthen family support, and improve road infrastructure to support employee work safety.

## Introduction

The need for people's mobility continues to increase along with technological developments, urbanization, as well as economic growth and population growth [1]. This condition encourages people to use fast, efficient, and flexible modes of transportation to support their daily activities. In Indonesia, motorcycles are chosen as the main mode of transportation because they are considered more practical and efficient in supporting daily activities in various terrains [2]. Based on data from the Central Statistics Agency, the number of two-wheeled motorized vehicles in Indonesia has reached more than 157 million units, with a fairly high number in Central Java and Semarang City [3]. The high use of motorcycles

contributes to the increased risk of traffic accidents, especially in the productive age group who are actively working [4].

Data from the National Police Corps shows that until 2024 there have been tens of thousands of cases of traffic accidents in Indonesia [5]. Globally, traffic accidents are estimated to cause around 1.35 million deaths each year and are among the leading causes of death globally, particularly in developing countries [6]. This condition shows that traffic accidents are still a serious problem in the field of public health. The majority of traffic accidents are triggered by human factors (*Human Error*), such as unsafe driving behavior, low compliance with traffic regulations, and not using complete personal protective equipment (PPE)[4]. Risky behaviors such as using mobile phones while driving, violating speed limits, and rushing on work trips also contribute to the occurrence of accidents [7].

One of the steps that can be taken to reduce the number of accidents is to implement behavior *Safety Riding*. *Safety riding* is a driving behavior that prioritizes safety through physical readiness, vehicle readiness, and compliance with traffic regulations [8]. In addition, *Safety Riding* also includes aspects of knowledge, attitudes, and awareness of risks on the road [9]. Safety riding behavior is influenced by various factors, both from within the individual and from the environment. Internal factors include age, level of knowledge, and experience, while external factors include road conditions, PPE use, and social support [10]. Family support is one of the social factors that can influence driving behavior, especially in increasing awareness and compliance with safety [11].

In the context of occupational safety and health, accidents during travel to and from work (*commuting accident*) is included in the category of work accidents according to Permenaker No. 5 of 2018[12]. This is very important, especially for health workers who have high mobility in carrying out service duties. The Karangmalang Health Center in Semarang City has the characteristics of a work environment with the risk of traffic accidents, such as uphill road conditions, sharp curves, and traffic density [13]. Therefore, research is needed to analyze factors related to safety riding behavior in health center employees to support efforts to prevent work accidents.

## Method

This study uses a quantitative analytical approach with a *cross-sectional design* which was carried out in the period December 2025 to January 2026 at the Karangmalang Health

Center, Semarang City. The research population includes all employees of the Karangmalang Health Center totaling 52 people, with a sampling method in the form of *total sampling*.

The independent variables in this study included age, working period, use of Personal Protective Equipment (PPE), road environmental conditions, and family support, while the dependent variable was *safety riding behavior*. Data was collected using a structured questionnaire that was filled out directly by respondents.

Data processing and analysis were carried out statistically using *the Pearson Product Moment* or *Spearman Rank correlation test* according to the results of the normality test, with a significance level of $p<0.05$.

The study has received ethical approval from the research ethics committee, and all respondents expressed their willingness to participate through *informed consent* before the data collection process is carried out.

## Results

Karangmalang Health Center is a health service facility in Mijen District, Semarang City, whose working area includes Karangmalang, Polaman, Purwosari, and Bubakan Villages. This health center provides health services inside and outside the building, including promotive and preventive activities that demand high employee mobility. Most employees use motorcycles as the main means of transportation in carrying out work activities, so it has the potential to increase the risk of traffic accidents both when leaving and after work and when carrying out duties. This research was carried out from December 27, 2025 to January 13, 2026 with a total of 45 active employees.

**Table 1.** Frequency Distribution Variables

| Characteristics | Frequency (F) | Percent (%) |
|---|---|---|
| **Age** | | |
| Age < 35 Years | 23 | 51.1 |
| Age ≥ 35 years old | 22 | 48.9 |
| **Gender** | | |
| Male | 12 | 26.7 |
| Women | 33 | 73.3 |
| **Working Period** | | |
| Working Period < 6 Years | 27 | 60 |
| Working Period ≥ 6 Years | 18 | 40 |
| **Traffic Accidents** | | |
| Ever | 26 | 57.8 |
| Never | 19 | 42.2 |
| **Use of PPE** | | |
| Bad < Score 26 | 23 | 51.1 |
| Good ≥ Score 26 | 22 | 48.9 |

| Characteristics | Frequency (F) | Percent (%) |
|---|---|---|
| **Road Environmental Conditions** | | |
| Bad < Score 26 | 26 | 57.8 |
| Good ≥ Score 26 | 19 | 42.2 |
| **Family Support** | | |
| Poor < Score 28 | 25 | 55.6 |
| Good ≥ Score 28 | 20 | 44.4 |
| **Safety Riding** | | |
| Poor < Score 25.58 | 21 | 46.7 |
| Good ≥ Score 25.58 | 24 | 53.3 |

Source: Primary Data 2025

Based on the results of the study, the characteristics of respondents who are employees of the Karangmalang Health Center in Semarang City show quite diverse variations. Most of the respondents were in the age group of <35 years, which was 23 people (51.1%), with a relatively balanced proportion compared to the age group of ≥35 years of 22 people (48.9%). Age grouping was carried out using the median value (35 years) as the cut off point because the data were not entirely normally distributed. In addition, the majority of respondents were female as many as 33 people (73.3%), while men were 12 people (26.7%).

Based on the working period, the majority of respondents had a working period of less than 6 years, namely 27 people (60.0%), while respondents with a working period of ≥6 years amounted to 18 people (40.0%). The categorization of the working period used a median (6 years) with consideration of abnormal data distribution. In terms of accident experience, more than half of the respondents, namely 26 people (57.8%) had experienced traffic accidents while working, which shows that the incidence of accidents is still quite high in this group.

In terms of behavior and driving safety supporting factors, the use of personal protective equipment (PPE) is still in the poor category, which is as many as 23 respondents (51.1%), compared to the good category of 22 respondents (48.9%). The condition of the road environment was also mostly rated as poor by 26 respondents (57.8%), while 19 respondents (42.2%) rated it in the good category. In addition, the majority of family support is in the poor category, namely 25 respondents (55.6%), which indicates that support for the implementation of driving safety is not optimal. The categorization of these variables uses the median because the data is not normally distributed.

However, the safety riding behavior of respondents in general was in the good category, namely 24 people (53.3%), although there were still 21 respondents (46.7%) in the poor category. The categorization of this variable uses a mean value (25.58) because the data is normally distributed.

**Table 2.** Bivariate Analysis Results

| Independent Variables | Dependent Variable | Statistical Test | *P-Value* | *α* | Correlation | Results |
|---|---|---|---|---|---|---|
| Age | *Safety Riding* | Rank Spearman | 0.027 | 0.05 | -0.329 | Significant |
| Working Period | *Safety Riding* | Rank Spearman | 0.560 | 0.05 | -0.089 | Not Significant |
| Use of PPE | *Safety Riding* | Rank Spearman | 0.089 | 0.05 | 0.257 | Not Significant |
| Road Environmental Conditions | *Safety Riding* | Rank Spearman | 0.017 | 0.05 | 0.353 | Significant |
| Family Support | *Safety Riding* | Rank Spearman | <0.001 | 0.05 | 0.542 | Significant |

Source: Primary Data 2025

Based on the results of the bivariate analysis in Table 2, it is known that the variables of age, road environmental conditions, and family support have a significant relationship with safety riding ($p < 0.05$). Age had a negative relationship with weak strength ($r = -0.329$), suggesting that older age groups tend to exhibit lower safety riding behavior. Road environmental conditions showed a positive relationship with weak strength ($r = 0.353$), which means that the better the road conditions, the better the safety riding behavior. Family support had a positive relationship with moderate strength ($r = 0.542$), so the better the family support, the better the respondents' driving safety behavior. Meanwhile, the variables of working period and PPE use did not show a significant relationship with safety riding ($p > 0.05$), although the direction of the relationship between PPE use was positive.

## Discussion

The results of the study indicate that the majority of Karangmalang Health Center employees are in the productive age range with an age range of 26-58 years. Productive age has high work mobility, especially in the use of motorcycles as a means of transportation for work, thus increasing exposure to the risk of traffic accidents[14]. In addition, the majority of respondents were female, which reflected the general condition of health workers in health centers dominated by women such as nurses and midwives [15]. Most of the respondents also

have a working period of <6 years, which shows that employees are still relatively new, so work experience in recognizing driving risks is still limited [16].

The majority of respondents also reported having experienced traffic accidents while working. This shows that the risk of accidents to employees is quite high, especially because motorcycles are widely used as the main mode in supporting work activities. Research conducted by Vieira et al on accident risk factors in motorcyclists revealed that this group has a higher level of accident vulnerability compared to users of other types of vehicles due to high mobility and lack of protection while driving [17]. This condition shows the importance of implementing safety riding behavior in employees with high work mobility.

In terms of the use of personal protective equipment (PPE), most of the respondents are still in the poor category. Although the use of PPE such as helmets and other riding gear can reduce the severity of injuries in an accident [18]. Research by Shanon Trivena Nusa et al. that examined the behavior of PPE use in motorcyclists shows that there are still many riders who have not used PPE completely, thus increasing the risk of injury during accidents [19].

In addition, some respondents also assessed the condition of the road environment in the bad category such as damaged roads, slippery roads, and lack of lighting which can increase the risk of traffic accidents. Research by Adib Wahyu Hidayat and Sri Rejeki Laku Utami which examined the factors that cause traffic accidents shows that damaged and slippery road conditions contribute to the increase in accident incidence [20]. Another study by Agus Aji Samekto and Jumaizi that examined the relationship between road conditions and driving safety also showed that road damage and lack of lighting have an effect on the increased risk of accidents [21].

Family support is also one of the factors that affect safety riding behavior. Most respondents had family support in the poor category. Research by Sofia Izmi and Desi Rusmiati that examined social factors on safety riding behavior shows that family support plays a role in providing reminders and motivation to individuals to drive safely [11]. Family support can increase individual awareness in implementing safety riding behaviors consistently.

Based on the results of bivariate analysis, it was shown that age had a significant relationship with safety riding behavior with a p-value of 0.027 and a correlation coefficient of -0.329. The results of the cross-tabulation showed that in the age group <35 years there were 17 respondents (73.9%) with good safety riding behavior and 6 respondents (26.1%) with poor behavior, while in the age group ≥35 years there were 10 respondents (45.5%) with good

behavior and 12 respondents (54.5%) with poor behavior. This suggests that younger age groups tend to have better safety riding behaviors. The results of this study are in line with the research of Irawan et al. who stated that age is related to driving safety behavior because it is related to experience and maturity in anticipating risks [2].

Road environmental conditions also showed a significant relationship with safety riding behavior with a p-value of 0.017 and a correlation coefficient of 0.353. The results of the cross-tabulation showed that in the bad category of road environmental conditions there were 16 respondents with poor safety riding behavior and 10 respondents with good behavior, while in the good category of road environmental conditions there were 5 respondents with poor behavior and 14 respondents with good behavior. This shows that respondents with good road environmental conditions tend to have better safety riding behavior. These results are in line with research by Petersen et al., who found that road conditions such as damaged surfaces, slippery roads, and inadequate lighting are associated with an increased risk of accidents [22]. In addition, family support showed a significant relationship with safety riding behavior with a p-value of <0.001 and a correlation coefficient of 0.542. The results of the cross-tabulation showed that in the group without family support, there were 11 respondents with poor behavior and 6 respondents with good behavior, while in the group receiving family support there were 10 respondents with poor behavior and 18 respondents showed behavior in the good category. These findings are consistent with the results of previous research that showed a similar trend, namely the research of Handoko et al. which stated that family support can improve driving safety behaviors through reminders and motivation [23].

Meanwhile, the working period did not show a significant relationship with safety riding behavior with a p-value of 0.560 and a correlation coefficient of -0.089. The results of the cross-tabulation showed that in the <6-year service period, there were 15 respondents (55.6%) with good behavior and 12 respondents (44.4%) with poor behavior, while in the ≥6-year service period, there were 9 respondents (50.0%) each with good behavior and 9 respondents (50.0%) with poor behavior. The use of PPE also did not show a significant relationship with safety riding behavior with a p-value of 0.089 and a correlation coefficient of 0.257, where in the poor PPE use group there were 14 respondents with poor behavior and 9 respondents with good behavior, while in the good PPE use group there were 7 respondents with poor behavior and 15 respondents with good behavior. This result is in line with previous research[16] and Shanon Trivena Nusa et al[19] which states that the working period and use of PPE are not

directly related to safety riding behavior. These findings show that safety riding behavior is influenced by various factors, both individual, environmental, and social support.

The research on the analysis of factors related to safety riding in employees of the Karangmalang Health Center in Semarang City has several limitations, namely employees have a dense health service schedule so that the researcher must adjust the time of data collection to the service schedule and rest time which causes the time to fill out the questionnaire to be limited, and this research was only carried out at one health center in Semarang City, so that the findings obtained have not been able to comprehensively represent *safety riding* behavior in all health center employees in Semarang City. Therefore, further research with a wider area coverage is needed so that the results produced are more representative.

## Conclusion

The conclusion of this study indicates that age, road environmental conditions, and family support are related to *safety riding behavior* in employees of the Karangmalang Health Center in Semarang City. On the other hand, the length of work and the use of personal protective equipment (PPE) did not show a meaningful relationship. The majority of respondents were in the age group of <35 years, female, and had a working period of less than 6 years, and some employees had experienced traffic accidents while working. In addition, the use of PPE, road environmental conditions, and family support are mostly still in the poor category, while safety riding behavior is mostly in the good category. Therefore, it is recommended that employees increase consistency in implementing *safety riding*, especially the complete use of PPE, increase driving awareness, and avoid unfit conditions and risky behavior. The health center is expected to support through periodic education and training, driving safety policies, and a monitoring system for the use of PPE. Family support also needs to be strengthened through supervision and habituation of safe behavior. In addition, local governments are expected to improve the quality of road infrastructure, lighting, and traffic signs to reduce the risk of accidents.

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