Factors Influencing Safety Consciousness and Violations Among Licensed Drivers

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Abstract
The primary objective of this research was to identify and analyze the factors influencing driving safety in Medan city. By utilizing survey data as the primary source, the researchers sought to employ logistic regression analysis to uncover key determinants. The overarching goal was to gain insights into the specific factors, such as gender, latest education, safety drive, miscalculation, and violation, that significantly impact driving safety in the targeted area. Survey data served as the foundation for this research, with logistic regression employed as the analytical tool of choice. The data collected from drivers in Medan was meticulously examined to assess the influence of various factors on driving safety. The results of the analysis revealed several noteworthy findings regarding driving safety in Medan. Gender, latest education, safety drive, miscalculation, and violation emerged as significant factors affecting driving safety in the city. Notably, safety drives and violations were identified as particularly influential in determining the overall safety of driving in Medan. The majority of drivers in Medan possessed a driver's license, with a significant proportion being teenagers. A correlation between driver's license prediction and variables such as status and latest education was observed. However, age did not exhibit a significant correlation with driving miscalculations. These findings provide a foundation for the development of targeted driving safety programs in Medan, emphasizing the importance of awareness, reducing violations, and considering demographic factors like gender and recent education for effective safety driving strategies.

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Abstrak
Tujuan utama penelitian ini adalah untuk mengidentifikasi dan menganalisis faktor-faktor yang mempengaruhi keselamatan berkendara di kota Medan. Dengan memanfaatkan data survei sebagai sumber utama, para peneliti berupaya menggunakan analisis regresi logistik untuk mengungkap faktor-faktor penentu utama. Tujuan utamanya adalah untuk mendapatkan wawasan tentang faktor-faktor spesifik, seperti gender, pendidikan terkini, keselamatan berkendara, kesalahan perhitungan, dan pelanggaran, yang secara signifikan berdampak pada keselamatan berkendara di area yang ditargetkan. Data survei menjadi landasan penelitian ini, dan regresi logistik digunakan sebagai alat analisis pilihan. Data yang dikumpulkan dari pengemudi di Medan diperiksa dengan cermat untuk menilai pengaruh berbagai faktor terhadap keselamatan berkendara. Hasil analisis mengungkapkan beberapa temuan penting mengenai keselamatan berkendara di Medan. Gender, pendidikan terkini, keselamatan berkendara, kesalahan perhitungan, dan pelanggaran muncul sebagai faktor signifikan yang mempengaruhi keselamatan berkendara di kota. Khususnya, keselamatan berkendara dan pelanggaran diidentifikasi sebagai faktor yang sangat berpengaruh dalam menentukan keselamatan berkendara secara keseluruhan di Medan. Mayoritas pengemudi di Medan memiliki Surat Izin Mengemudi, dan sebagian besar adalah remaja. Korelasi antara prediksi SIM dan variabel seperti status dan pendidikan terakhir diamati. Namun, usia tidak menunjukkan korelasi yang signifikan dengan kesalahan perhitungan mengemudi. Temuan-temuan ini memberikan landasan bagi pengembangan program keselamatan berkendara yang ditargetkan di Medan, menekankan pentingnya kesadaran, mengurangi pelanggaran, dan mempertimbangkan faktor demografi seperti gender dan pendidikan terkini untuk strategi keselamatan berkendara yang efektif.

I. INTRODUCTION

Traffic accidents are increasing every year, possibly because of vehicle collisions resulting in injuries and property damage. Driving fatigue is a major factor in traffic accidents, which accounts for 14% - 20% of motor vehicle accidents causing serious injuries and fatalities. Therefore, greater

attention has been paid to driving safety in recent years.

Driving safety is affected by several factors, including dull environments, lack of sleep, chronic drowsiness, drug, and alcohol use, of which the most common factor is fatigue while driving. In such situations, drivers are likely to fall asleep and drive unknowingly, which is not only a serious threat to the driver's own life and safety, but also a serious threat to pedestrians and other vehicles involved. Fatigued driving is one of the most frequent factors leading to traffic accidents. According to a survey, nearly 60% of drivers admit that they experience fatigue while driving and nearly 2% of them have been in a traffic accident. Every year, there are about 20% of traffic accidents related to fatigue driving worldwide (Luo, Qiu, Liu, & Huang, 2019; Ma et al., 2019). According to data on the number of traffic accidents that have occurred over the past three years (2020-2023) in the province of North Sumatra, with a presentation of the number of accidents occurring at 6%, serious injuries at 4% and material losses reaching 25% (SUMUT;, 2023). Therefore, further attention is needed in efforts to prevent traffic accidents and improve safety on the roads of North Sumatra Province.

Among today's youth, especially males, 73% have traffic accidents compared to females. The most frequent age category is under 25 years old. Developing countries record higher rates of road traffic crashes, with 93% of fatalities coming from low- and middle-income countries (WHO, 2023). More broadly, traffic accidents have a serious impact on national economies, costing as much as 3% of a country's annual gross domestic product. Governments are making efforts to reduce traffic crashes and the 2030 Sustainable Development Agenda has set targets to reduce injuries from traffic crashes.

However, 76% safe safety riding behavior and 24% unsafe. With chi-square analysis, variables that are significantly related to safety riding on online motorcycle taxi drivers the variables of knowledge (P-value 0.000), attitude (P-Value 0.000) and driving period (Ramadhani, 2021). The impression of safety riding counseling, which involved high school / high school students and the age range 16-25 years stated that 67.3% of respondents had behaved safely when driving. The overall percentage of behavioral intentions is 84.3%, students' knowledge of the relationship between safe driving behavior is 68.3%, students who do not have a type C driver's license (SIM C) are 55%, but currently there is no data for the driving license. This is one of the concerns for related agencies, such as schools can also pay attention to students who ride motorbikes and give warnings to students who do not have a SIM C. and partner with related agencies such as conducting socialization, safety riding training and driving licenses if the age is met (Danielle, Kusumawati, & Husodo, 2020).

In determining the model of choosing the mode of transportation of private vehicles or public transportation, with the dependent variable being public transportation and private transportation and the general variables are gender, pocket money, transportation costs, distance of residence, vehicle ownership, driver's license ownership, travel time and reasons for transportation modes. These variables were analyzed using binary logistic regression analysis. The result of the research is that the variables of male gender, owning a vehicle and having a driver's license have a significant influence on the mode of transportation either. The percentage of riders based on male gender is 99.5% (Nugraheni & Haryadi, 2022). The percentage of men is very significant in driving modes of transportation compared to women. The statistical method used in this study is chi-square analysis. Among them, 36.1% of riders have experienced traffic accidents, and 39.2% of them have bad riding behavior, 38.1% of riders are influenced by bad vehicle factors. 40.2% were affected by poor environmental factors and 34% were affected by riders wearing poor protective equipment. Based on the chi-square analysis, there is a significant relationship between traffic accidents in two-wheeled motorcyclists on driving behavior (p-value = 0.038), vehicle factors (p-value = 0.000), environmental factors (p-value = 0.003) and the use of personal protective equipment (p-value = 0.04) (Fitri, Hilal, & Sugiarto, 2023).

Based on the ownership of a driver's license and participation in the test, there is no significant relationship with traffic accidents (Nastiti, 2017). It is necessary to consider carefully whether there is a relationship between the ownership of a driver's license and the level of traffic accidents on the road. Therefore, it needs to be analyzed/reviewed about the ownership of a driver's license with other variables studied. Driving safety is an essential issue in Indonesia due to the high number of traffic accidents. This research aims to analyze the factors that influence driving safety, especially in Medan city. Survey data was used as the data source and analyzed using logistic regression. The results of the analysis show that

the factors that influence driving safety in Indonesia are gender, latest education, safety drive, miscalculation, and violation. In addition, the results of the analysis also show that safety drives and violations have a significant influence on driving safety. In this study, we used data from a survey of driver characteristics in Medan.

The analysis techniques used in this study are descriptive statistical tests, cross tabulation to determine the proportion of each variable and logistic regression analysis to determine which independent variables affect the dependent variable. From this study, it is expected to obtain a driver relationship model on the highway that can be used as an analysis of driving behavior in the city of Medan. So later it can be used by the government as a reference for infrastructure development in the city of Medan and become reference data to driver safety. This research will discuss whether there is a relationship between driver's license ownership and driver's age, gender, vehicle ownership, education, occupation, and length of service performed.

II. METHOD

Statistics is the science and application of human knowledge development using empirical data. Statistics includes the activities of planning, collecting, compiling, summarizing, storing, processing, presenting, analyzing and interpreting data (Kuncoro, 2023; Kurniawan & Wulandari, 2021). Statistical methods are divided into two, namely descriptive statistical methods and inferential statistical methods. Descriptive statistics is a method of how to collect numbers in the form of records and present these numbers in graphical form to be analyzed and interpreted by making decisions (Tri Hidayati, 2020; Martias, 2021; Mishra et al., 2018). Meanwhile, inferential statistics are identical to analyzing data and drawing conclusions. This inferential statistic is related to parameter estimation and hypothesis testing in an analysis (Tri Hidayati, 2020; Sutopo & Slamet, 2017).

Cross tabulation analysis serves to create data in the form of rows and columns against parameters of continuous variables (Jaya & Warti, 2022). For example, cross tabulation between driver's license and age and gender, driver's license and education and gender, and driver's license and status and gender. Correlation analysis is used to determine the direction of the relationship, the strength of the relationship and the significance of the relationship between variables (Ridayanti, Adiliawijaya, & Saulina, 2021; Roflin & Riana, 2022). Referring to table 1 as the data in correlation analysis.

Table 1. Analysis of correlation

Value Correlation	Level of Relationship
0,00 – 0,199	Very low
0,20 – 0,399	Low
0,40 – 0,599	Medium
0,60 – 0,799	Strong
0,80 – 1,00	Very Strong

In determining the binary regression analysis model with the dependent variable is a driver's license (Yes/No). This method is used to determine the probability of occurrence of the dependent variable (Kumalawati, Aklis, Bella, & Rizal, 2023). The following is the testing sequence in the binary logistic regression method. The first stage performed is the G statistical test to determine the multivariable logistic regression model for each dependent variable with independent variables.

$$H_0 : \beta_1 = \beta_2 = \cdots = \beta_p = 0$$
$$H_1 : at\ least\ one\ \beta_1 \neq 0,$$

Statistics test:

$$G = -2 \ln \left[\frac{\left(\frac{n_1}{n}\right) n_1 - \left(\frac{n_0}{n}\right) n_0}{\prod_{i=1}^{n} \hat{\pi_i}^{y_i} (1 - \hat{\pi_i})^{(1-y_i)}} \right] \qquad (1)$$

Description:

n_0 is the number of observations with category y = 0

n_1 is the number of observations with category y = 1

n is the number of observations.

Placement Area: Reject H0 if G>$\chi^2(db, \alpha)$ or p-value < α. This means that the independent variable affects the dependent variable. The test of each parameter (W test) is conducted to determine which independent variable is significant to the dependent variable.

Hypothesis:

$H_0 : \beta_k = 0$ (Independent variable is not significant to independent variable)

$H_1 : \beta_k \neq 0$ (Independent variable significant to independent variable)

$$W = \frac{\beta_k}{SE(\beta_k)} \qquad (2)$$

β_k is the parameter estimate and $SE(\beta_k)$ is the estimated standard error. k =1,2,..., p. p is the number of independent variables in the model.

Refuse H_0, if $W > Z_{\alpha/2}$

The logistic regression model fit test is carried out to determine whether the resulting model is appropriate or not. The appropriate model is a model that has no difference between observations and possible model predictions.

Hypothesis:

H_0: the model fits the data (there is no significant difference between the observations and the possible predictions of the model).

H_1: the model does not fit the data (there is a significant difference between the observations and the possible predictions).

$$\hat{C} = \sum_{k=1}^{g} \frac{(O_h - n_h \hat{\pi}_h)^2}{n_h \hat{\pi}_h (1 - \hat{\pi}_h)} \quad (3)$$

Description:

g = number of groups

O_h = number of values of the dependent variable

$\hat{\pi}_h$ = average estimated probability

n_h = number of subjects in the h group

H_0 decline, if $\hat{C} > \chi^2(db, \alpha)$, with significant level (α) and free degree (db). The degree of freedom $(db) = g - 2$, where g is the number of groups. If you reject H_0, then the model is appropriate and there is no difference between the observation and prediction results. Odds Ratio is conducted to determine the risk comparison in the logistic regression model.

$$OR = \frac{p}{1-p} \quad (4)$$

p represents the probability of success $(y = 1)$ and 1- p is the probability of failure $(y = 0)$, ψ is the ratio of odds values for two individuals.

$$\psi = \left[\frac{\frac{p(X_A)}{1-p(X_A)}}{\frac{p(X_B)}{1-p(X_B)}} \right] \quad (5)$$

Where X_A is individual character A and X_B is individual character B.

$$P(y = 1|x) = \frac{exp(x)}{1 + exp(x)} \quad (6)$$

$$z = \beta_0 + \beta_1 x_1 + \cdots + \beta_p x_p \quad (7)$$

It can be concluded that the odds ratio is the ratio between the probability of event $y = 1(success)$ and the probability of event $y = 0(failure)$. If observation y is a success with data-i then $y_i = 1$, with odds π_i and if observation $y_i = 0$, with odds $1 - \pi_i$. So it can be concluded that the odds ratio is used to compare the chances of success and the chances of failure.

Table 2. Research variables

Variable	Scale	Category
Driver license	Nominal	Yes
		No
Age	Nominal	Youth
		Adult
		Elderly
Status	Nominal	Married
		Single
Gender	Nominal	Male
		Female
Education	Ordinal	High School
		Degree
		Master
Safety Drive	Ratio	Extremely Disagree
		Disagree
		Neutral
		Agree
		Extremely Agree
Violations	Ratio	Extremely Disagree
		Disagree
		Neutral
		Agree
		Extremely Agree
Miscalculation	Ratio	Extremely Disagree
		Disagree
		Neutral
		Agree
		Extremely Agree

The age variable is divided into youth (12-25 years), adults (25-45 years) and elderly (46-65 years). The characteristics in this research are as follows in table 2. The scales based on data measurement will be divided into Nominal, Ordinal, Interval and Ratio (Nurizzati, 2016; Saifuddin, 2020).

1. A nominal scale is used to give a code or mark of some object. This data scale only marks variables without distinguishing values. Examples of gender, address, color, type of food, etc.
2. Ordinal scale, a scale that has levels but does not have interval equality and zero values have no meaning. This scale is also usually used in determining ratings. Examples: level of education, achievement, military rank, shirt size, etc.
3. Interval scale has a level of strength and interval equality but does not have an absolute note value. This scale is a

combination of nominal and ordinal scales. In this scale has a distance from one another with equal weight. Example: body temperature measurement, time, etc.

4. This ratio scale has an absolute zero value and has the same distance. Examples: age, GPA, measurement results, etc.

III. RESULTS AND DICSUSSIONS

The variables used in this study are driver's license, age, status, gender, last education, safety drive, calculation error and violation. Based on the table 3, results of descriptive analysis in this research are:

Table 3. Characteristic Variable

Variable	Category	Percentage (%)
Driver License (SIM)	No	28.50%
	Yes	71.50%
Age	Youth	84.80%
	Adult	9.90%
	Elder	5.30%
Status	Married	13.20%
	Single	86.80%
Gender	Male	62.30%
	Female	37.70%
Education	High School	74.80%
	Degree	7.90%
	Master	17.20%
Valid		100.00%

Based on table 3, it can be concluded that there are still drivers who do not have a driver's license (SIM) as much as 28.5% and drivers who have a driver's license as much as 71.5%. The age category is divided into adolescents, adults, and the elderly. Teenagers have a higher percentage than adults and the elderly. Teenagers (84.8%), adults (9.9%) and the elderly (5.3%). For the status variable category, unmarried (86.8%), this percentage is higher than married (13.2%). Gender variable, the percentage of male riders (62.3) is higher than female riders (37.7%). The education variable consists of high school, bachelor's degree, and master's degree. High school (74.8%) is higher than other education, undergraduate (7.9%) and graduate (17.2%).

According on table 4, youth who have a driver's license and are male (53.1%) have a higher rate than youth who are female and have a driver's license (15.6%). As for the category of adolescents who do not have a driver's license and are male (7.8%), this is inversely proportional to adolescents who do not have a driver's license and are female (23.4%) For the elderly age category, both male (50%) and female (50%), all have a driver's license. In the adult category, males (73.3%) and females (6.7%) did not have a driver's license. For females, those with a driver's license (6.7%) and those without a driver's license (13.3%).

Table 4. Cross Tabulation of Driver's License, Age and Gender

Age				Driver License		Total
				No	Yes	
Youth (12 - 25)	Gender	L	Count	10	68	78
			%	7.8%	53.1%	60.9%
		P	Count	30	20	50
			%	23.4%	15.6%	39.1%
Adult (26 - 45)	Gender	L	Count	1	11	12
			%	6.7%	73.3%	80.0%
		P	Count	2	1	3
			%	13.3%	6.7%	20.0%
Elder (46-65)	Gender	L	Count		4	4
			%		50.0%	50.0%
		P	Count		4	4
			%		50.0%	50.0%
Total	Gender	L	Count	11	83	94
			%	7.3%	55.0%	62.3%
		P	Count	32	25	57
			%	21.2%	16.6%	37.7%

Table 5. Cross Tabulation of Driver's License, Occupation and Gender

Ocupption				Driver License		Total
				No	Yes	
Student	Gender	P	Count		1	1
			% of Total		100.0%	100.0%
Degree	Gender	L	Count	9	62	71
			% of Total	7.6%	52.5%	60.2%
		P	Count	29	18	47
			% of Total	24.6%	15.3%	39.8%
Lecturer	Gender	L	Count	1	14	15
			% of Total	4.3%	60.9%	65.2%
		P	Count	3	5	8
			% of Total	13.0%	21.7%	34.8%
Private Employee	Gender	L	Count	1	7	8
			% of Total	11.1%	77.8%	88.9%
		P	Count	0	1	1
			% of Total	0.0%	11.1%	11.1%
Total	Gender	L	Count	11	83	94
			% of Total	7.3%	55.0%	62.3%
		P	Count	32	25	57
			% of Total	21.2%	16.6%	37.7%

Based on Table 5, we can observe that there is one student who has a driver's license. When we consider the category of university students, 52.5% of male students have a driver's license, while only 15.3% of female students have a driver's license. On the other hand, the percentage of male students who do not have a driver's license is 7.6%, which is lower than the 24.6% of female students. For the Lecturer category, the majority of males (60.9%) have a SIM, while only 21.7% of female lecturers have a SIM. Within this group, there is only one male lecturer (4.3%) who does not have a SIM, and three female lecturers (13%) who do not have a SIM. When we look at the private employee's

category, we see that 83.3% of male employees have a driver's license, while only 16.7% of female employees have a driver's license. Finally, in the Employee category, 66.7% of male employees have a driver's license, while 33.3% of male employees do not have a driver's license

Table 6 describes that there are male drivers who have a driver's license, and their status is married (65%) and unmarried (0%). While those who do not have a driver's license and female (10%). In the unmarried category, men who have a driver's license (53.4%) and women (15.3%). For women who are not married and do not have a driver's license (22.9%), men who do not have a driver's license (8.4%).

Table 6. Cross Tabulation of Driver's License, Marital Status and Gender

Status				Driver License		Total
				No	Yes	
Married	Gender	L	Count	0	13	13
			%	0.0%	65.0%	65.0%
		P	Count	2	5	7
			%	10.0%	25.0%	35.0%
Single	Gender	L	Count	11	70	81
			%	8.4%	53.4%	61.8%
		P	Count	30	20	50
			%	22.9%	15.3%	38.2%

Table 7. Variable Relationship

	1	2	3	4	5	6	7	8
Age	-							
Status	-.876**	-						
Gender	-.055	.022	-					
Education	.779**	-.679**	-.093	-				
Driver License	.151	-.160*	-.477**	.107	-			
Safety Drive	-.124	.048	.179*	-.040	.008	-		
Miscalculation	-.076	.092	-.140	-.108	-.082	-.125	-	
Violations	-.019	.092	-.270**	-.076	.246**	-.360**	.081	-
**. Correlation is significant at the 0.01 level (2-tailed).								
*. Correlation is significant at the 0.05 level (2-tailed).								

Table 7 indicates that there is a very strong and negative correlation between Status and Age with a correlation value of -0.876. Meanwhile, the relationship between education and status also has a strong influence with a negative direction, indicated by a correlation value of -0.679. Gender and driver's license ownership have a moderate influence and negative direction, with a correlation value of around -0.477. On the other hand, the relationship between violations and driving safety has a moderate influence and a negative direction with a correlation value of around -0.366. In addition, there is a significant relationship between education and age with a very strong and positive influence, reflected in a correlation value of about 0.779. Similarly, there is a relationship between offenses and driving safety with a moderate influence and positive direction.

Table 8. Model Fit Test (Hosmer and lemeshow test)

Step	Chi-square	df	Sig.
1	33.155	8	.000

Hypothesis:
H_0: Model fits
H_1: The model does not fit.

Based on table 8, it can be seen the sig value. (0.000) and χ^2 value (33.155). because of the sig value. <0.05, it can be concluded that the model does not fit. This means that age, gender, education, status, safety drive, miscalculation and violation do not contribute significantly to the driver's license. This should be noted in the analysis, if tested simultaneously, the model does not fit, so further analysis needs to be done individually (test per variable). The Omnibus Test of model Coefficient test was conducted to determine the significance of all parameters using the G test. based on table 8, it was found that the chi-square value $\chi\chi^2 = 60.477$ and sig. (0.000). because the value of Sig. <0.000, it can be concluded that at least one independent variable (age, gender, status, education, safety drive, miscalculation, and violation) has a significant effect on the dependent variable, namely driving license (refer to table 9).

Tabel 9. Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	60.477	7	.000
	Block	60.477	7	.000
	Model	60.477	7	.000

Table 10. Summary Model

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	119.937	.330	.473

According to table 10, it can be concluded that the G value = 119.937 and the Nagelkerke R Square value is 0.473. Independent variables (age, gender, status, education, safety drive, miscalculation, and violation) can explain the driving license by 47.3%. The remaining 52.7 is influenced by other factors. Variable Age (X_1), Status (X_2), Gender (X_3), Education (X_4), Safety drive (X_5), Calculation Error (X_6), Violation (X_7).

Table 11. Driver's license prediction with factors (age, status, gender, education, safety drive, miscalculation, and violation)

Variable	B	S.E.	Wald	Sig.	OR
Age	1.781	1.405	1.608	0.205	5.937
Status	-1.676	1.836	0.834	0.361	0.187
JK	-2.983	0.574	27.02	0.000	0.051
Education	-0.598	0.466	1.642	0.200	0.550
Safety Drive	0.989	0.345	8.238	0.004	2.689
Miscalculation	-0.694	0.308	5.057	0.025	0.500
Violation	0.929	0.349	7.101	0.008	2.531
Constant	3.406	5.298	0.413	0.520	30.154
Chi-Squared = 33.155; Sig < 0.000, Percentage = 71.5%					
SE = Standard Error, OR = odds ratio					

Based on table 11, it can be explained that there are several independent variables that have a significant effect on the dependent variable. This can be seen based on the Sig value <0.05. age (p-value = 0.205), status (p-value = 0.361), education (p-value = 0.2) has no significant effect on driver's license. While gender (p-value = 0.000), safety drive (p-value = 0.004), miscalculation (p-value = 0.025) and violation (p-value = 0.008) influence driver's license.

Table 12. Equation Variable

Variable	B	S.E.	Wald	Sig.	OR
JK (1)	3.081	0.592	27.10	0.000	21.77
Safety Drive (2)	-4.573	1.472	9.653	0.002	0.010

Hypothesis in partial / individual testing

H_0: Gender and safety driving have no significant effect on driver's license.

H_1: Gender and safety driving have a significant effect on driver's license (SIM).

With a confidence level value of 95% (Sig = 0.05), reject H_0 if the Sig value < p-value.

Based on table 12, it can be concluded that of all the variables (age, status, gender, education, safety drive, miscalculation, and violation), only gender (male) p-value = 0.000 and safety drive (when driving need concentration and avoid smoking) p-value = 0.0002 have a significant effect on driver's license. From table 12, the following equation is obtained:

$$g(x) = 3{,}081X_3 - 4{,}573X_5$$

$$ln\left(\frac{\pi(x)}{1-\pi(x)}\right) = 3{,}081X_3 - 4{,}573X_5$$

$$\frac{\pi(x)}{1-\pi(x)} = \exp(3{,}081X_3 - 4{,}573X_5)$$

$$\hat{\pi}(x) = \frac{\exp(3{,}081X_3 - 4{,}573X_5)}{1 + \exp(3{,}081X_3 - 4{,}573X_5)}$$

Exp(B) value is the Odds Ratio Gender

$$(X_3) = exp(3{,}081)$$

$$exp(3{,}081) = e^{(3{,}081)} = 21{,}78$$

Safety drive:

$$(X_5) = exp(-4{,}573)$$

$$exp(-4{,}573) = e^{(-4{,}573)} = 0{,}0086$$

The Wald test was conducted to test the coefficients in logistic regression.

Gender

$$X_3 = \left(\frac{\beta}{S.E}\right)^2 = \left(\frac{3{,}081}{0{,}592}\right)^2 = 27{,}085$$

Safety drive

$$X_5 = \left(\frac{\beta}{S.E}\right)^2 = \left(\frac{-4{,}573}{1{,}472}\right)^2 = 10{,}426$$

From the Odds ratio test results of the gender variable (X_3), it is known that $\beta_3 > 0$, that male drivers have a probability of a driver's license of 21.78 while the variable of drivers who behave about safety drive (X_5) has a probability of a driver's license of 0.0086. Drivers who know about safety drive have the least risk of not having a driver's license, which means that every driver who is aware of safety driving must have a driver's license.

Table 13. Model Classification

Observed			Predicted		
			Driver License		Percentage Correct
			No	Yes	
Step 1	SIM	No	32	11	74.4
		Yes	13	95	88.0
	Overall Percentage				84.1

Based on table 13, the forecasting ability of this model with a success rate is 84.1%. From 88%, it predicts 95 drivers who have a driver's license and 11 drivers who do not have a driver's license.

IV. CONCLUSION AND SUGGESTION

A. Conclusion

In this research, we examined the impact of various factors, including age, status, gender, education, safety habits, miscalculations, and driver's license violations, on driver's license ownership. Our findings reveal some noteworthy trends. First, we observed a significant gender gap in license ownership, with more male drivers than female drivers. This observation highlights the need for a gender-specific approach in promoting license

ownership. Secondly, the age category analysis shows that some teenagers still do not have a driver's license. This underscores the importance of targeted initiatives, such as education programs in schools and communities, to emphasize the importance of driver knowledge and license acquisition among this demographic. In addition, our correlation analysis found a strong positive relationship between education and age, indicating that as people get older, they tend to achieve higher levels of education. Conversely, we found a negative correlation between status and age, which suggests that status may decrease with age. Interestingly, the correlation analysis also showed a negative relationship between gender and driver's license ownership, with a correlation coefficient of -0.477.

However, when we conducted the logistic regression analysis, we identified that gender, safety habits, miscalculations, and driver's license violations were the variables that had the most significant impact on license ownership. In summary, although age, education, and status showed a strong correlation, they did not have the same level of influence as gender, safety habits, miscalculations, and driving violations in predicting driving license ownership. These findings emphasize the need for targeted interventions and educational campaigns to address the identified factors affecting driver's license ownership.

B. Suggestion

The discussion regarding this research is still very limited and requires a lot of input. The suggestion for future authors is to study it more deeply and comprehensively about Factors Influencing Safety Consciousness and Violations Among Licensed Drivers.

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