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Factors Affecting Intention to Wear Motorcycle Helmets Using an Integrated Models

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Abstract

Motorcycle in DKI Jakarta reach 16,519,197 units and continue to increase every year, where the level of traffic accidents in this region is dominated by motorcycles. Data shows that victims of severe injuries due to motorcycle accidents in DKI Jakarta that caused severe head injuries continued to increase, reaching 499 people during 2021. Data collection was collected by using an online questionnaire distributed to 402 respondents. This research was conducted by integrating Theory of Planned Behavior, Health Belief Model, and Locus of Control to analyze the factors that influence the intention to use helmets. Data processing for the research model will be carried out using the PLS-SEM method with the software used is SMART PLS. The research results show that the empirical model's variable constructs state that the constructs of Perceived Behavioral Control, Subjective Norms, Positive Attitude, Perceived Susceptibility, and Internality influence the intention to use helmets in the DKI Jakarta. It was concluded that having a reminder system connected to public service broadcasts that contain reminder messages about the importance of driving safety, implementing e-tickets at several minor road points to cover all small road areas in the DKI Jakarta area, marking motorbike driver's licenses to identify how often the driver violates by not wearing a helmet while driving, and education to increase the intention of using helmets for motorbike drivers in DKI Jakarta.

Keywords: *Accidents, Health Belief Model, Helmets, Locus of Control, Motorcycle, PLS-SEM, Theory of Planned Behavior, Traffic.*

INTRODUCTION

Motorcycles are the most widely used means of land transportation in DKI Jakarta. Motorcycle users in DKI Jakarta have reached 16,519,197 units and continue to increase yearly as shown in Figure 1. The DKI Jakarta Central Statistics Agency (BPS) informed that traffic accidents were dominated by motorbikes. Every year, the number of seriously injured victims from these accidents continues to increase until 499 victims as shown in Figure 2. Ditlantas Polda Metro Jaya stated that the severe injuries resulting from the motorcycle accident included injuries to the head. Several research state that many motorcycle vehicle accidents cause severe injuries because the rider does not use protective equipment or a helmet (Syakuran et al., 2022; Umniyatun et al., 2021).

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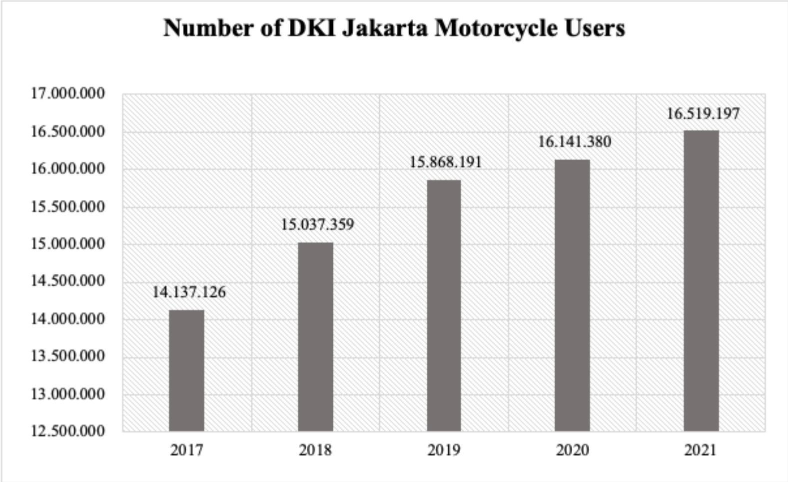

Figure 1. Number of DKI Jakarta Motorcycle Users

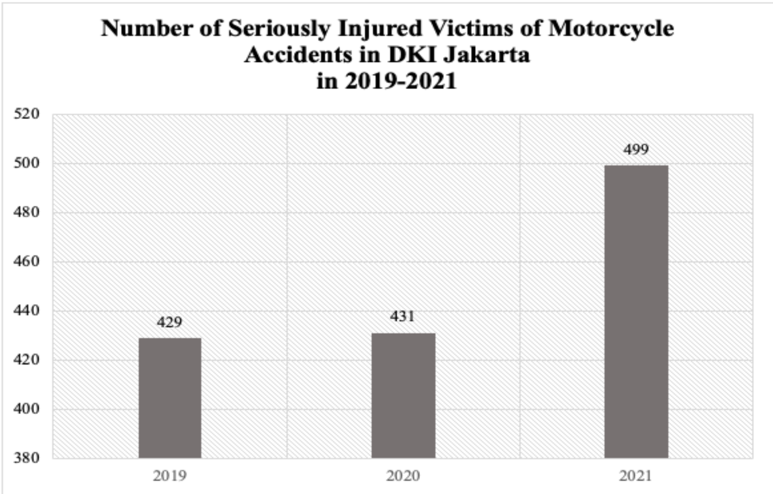

Figure 2. Number of Severe Injured Victims of Motorcycle Accidents in DKI Jakarta

Using a helmet when driving on motorbike transportation can minimize the risks obtained in an accident, especially in head injuries, by up to 88% (Abdi et al., 2022). Several behavioral models can explain the intention to use helmets through several behavioral models, such as the Theory of Planned Behavior (TPB), Health Belief Model (HBM), and Locus of Control (LOC), where this has been done in various countries. However, in Indonesia, especially in DKI Jakarta, research related to the use of helmets for motorcyclists is limited to the level of helmet use, which does not refer to the development of behavioral models and factors that cause or influence individual behavior toward the intention to use the helmet.

Several research that have been conducted have only used one variable model approach, such as the research by Ghasemzadeh et al. (2017) where this research only used the TPB variable model approach and Zavareh et al. (2018) only uses the HBM variable model approach. While research conducted by Conrad et al. (1996), Lajunen and Rasanen. (2004), Kamarudin Ambak et al. (2011). Kumphong et al. (2018), and Champahom et al. (2019) uses several model approaches to see a comparison of the three in terms of the suitability of the model.

The TPB behavior model variable in this research will be developed by dividing the Attitude variable into two categories, namely Positive Attitude and Negative Attitude. It showed that it is essential to distinguish between positive and negative attitudes toward individuals (Champahom et al., 2019). Many social psychological models have been examined to develop models of helmet use intention found that the two main reasons why people decide to wear helmets are related to their own decisions, which consist of positive and negative attitudes as well as the potential to control their own behavior and the advice of others (Champahom et al., 2019; Lajunen & Räsänen, 2004).

In the HBM model, the variables that will be used are only Perceived Susceptibility and Perceived Severity. In the research of Champahom et al. (2019) were informed that Perceived Benefits produce Positive Attitudes, and Perceived Barriers produce Negative Attitudes, where these variables are included in the TPB behavior model. The use of the LOC model has been shown to be able to predict the intention to use a helmet well, as in a research conducted by Lajunen and Rasanen (2004), Kumphong et al. (2018), and Champahom et al. (2019).

This research aims to identify the factors that have a significant effect on the intention to use a helmet on motorcyclists in the DKI Jakarta area, analyze and determine the appropriate model related to the intention to use a helmet on motorcyclists in the DKI Jakarta area by using a helmet with a combination of TPB, HBM, and LOC models, and provides implementation suggestions to increase the intention to use helmets among motorcyclists in DKI Jakarta.

LITERATURE REVIEW

Theory of Planned Behavior

Many behavioral models have been used to determine the factors influencing the intention to use helmets. TPB is research that studies individual behavior by considering the three main variables that make up the TPB model, namely Attitude, Subjective Norms, and Perceived Behavioral Control (Ajzen, 2020).

Attitude is an essential factor in explaining behavior and how to measure human attitudes (Fu, 2021). Subjective norms refer to social pressure individuals feel to do or not to do a behavior. Meanwhile, Perceived Behavioral Control is a factor that refers to individual perceptions of the ease or difficulty of carrying out a particular behavior (Ajzen, 2020). TPB is used as a reference model for most research that aim to determine the factors that influence intention towards something, such as in research conducted by (Ambak et al., 2011; Champahom et al., 2019; Conrad et al., 1996; Ghasemzadeh et al., 2017; Kumphong et al., 2018; Lajunen & Räsänen, 2004).

Health Belief Model

The Health Belief Model (HBM) is a model that can explain behavior related to health, where this behavior model has four main variables, namely perceived susceptibility, perceived severity, perceived benefits, and perceived barriers (Rosenstock et al., 1988; Sulat et al., 2018).

HBM is supported by sufficient motivation to make a problem of high urgency, a belief that everyone is susceptible to health problems, and a belief that following health recommendations will be beneficial in reducing the threats and losses incurred. Wearing a helmet while riding a motorcycle can reduce the risk of head injury and death as motorcyclists are 30 times more likely to be killed in an accident. This can have a long-term impact on health problems and requires a particular cost of treatment until healthy again.

Locus of Control

This behavior model predicts behavior that is influenced by internal and external factors. Internal factors can be explained by having a personal attitude that feels that everything that happens, and the consequences of these events can be controlled by oneself, while external factors cannot be controlled by oneself (Uttra et al., 2020).

This is proven by study conducted by Lajunen & Räsänen (2004) and Champahom et al. (2020) which states that the externality factor of the LOC behavior model has a significant influence on the intention to use helmets in Finland and Thailand.

Partial Least Square-Structural Equation Modeling (PLS-SEM)

PLS-SEM or Partial Least Square-Structural Equation Modeling is a development of the SEM or Structural Equation Modeling method where this method is a multivariate analysis technique used to describe the linear relationship between indicator variables and latent variables (Ajzen, 2020). The study that conducted by Ambak et al. (2011); Fallah Zavareh et al. (2018); Kumphong et al. (2018); Lajunen & Räsänen (2004) the SEM method is used, while in this study PLS-SEM is used to identify factors that have an influence on the intention to use helmets in DKI Jakarta. This is because PLS-SEM does not require certain distribution assumptions and has no limit on the number of indicators, which will still provide a solution even though the indicators used to measure latent variables are only a few or the number of construct variables is large (Matthews et al., 2018).

Relatived Works

using the behavioral model approach of the Theory of Planned Behavior, Health Belief Model, and Locus of Control has been conducted in several countries. In research conducted by Lajunen & Räsänen (2004) examined the intention to use helmets among cyclists among Helsinki adolescents by comparing three behavioral models namely TPB, LOC, and HBM by adding several variables such as cues to action and health motivation in the HBM model and dividing the attitude variable in the TPB model into instrumental attitude and emotional attitude. The TPB and LOC models were appropriate in explaining the intention to use bicycle helmets compared to the HBM model with the influential variables are Attitude, Emotional Attitude, Subjective Norms, and Perceived Behavioral Control, and External.

Ambak et al. (2011) did the same thing on motorcycle riders in Malaysia by applying the TPB, HBM, and Technology Acceptance Model (TAM) approaches. TAM has two main variables, namely Perceived Usefulness and Perceived Ease of Use. In the TAM model the variable Perceived Usefulness has a function to identify factors of ease of use, and the variable Perceived Usefulness has a function to identify factors of benefit to use.

Kumphong et al. (2018) compared three models namely TPB, HBM, and LOC in line with research conducted by Lajunen & Räsänen (2004). However, in this research, the Attitude variable was not divided into the TPB model. Research by Kumphong et al. (2018) shows that the TPB model is the most appropriate model in predicting the intention to use helmets for motorbike riders in Vietnam.

Champahom et al. (2020) compared TPB and LOC to determine the intention to use helmets for motorists in Thailand. The Attitude variable divided into two parts; (1) Positive Attitude which is considered to have the ability to influence the intention to use a helmet, (2) Negative Attitude variable which is considered to have no effect on the intention to use a helmet.

Ghasemzadeh et al. (2017) used the Theory of Planned Behavior (TPB) behavioral model approach and Zavareh et al. (2018) used the Health Belief Model (HBM) behavioral model approach.

METHOD

This research starts from the observation of literature research to determine the respective use of the TPB, HBM, and LOC behavior models. The results of this stage will be used to decide the reference model and hypotheses for this research. The data is collected from the questionnaire and will be processed using the PLS-SEM method. The first part of questionnaires showed the respondents demographic data, and the second part compares statements on the TPB, HBM, and LOC behavior model variables. The variables used in this research are Positive Attitude, Negative Attitude, Subjective Norms, Perceived Behavioral Control, Perceived Susceptibility, Externality, Internality, and Behavioral Intention.

The population used in this research is the number of residents of DKI Jakarta who own motorbikes at least 17 years old, with non-probability purposive sampling of motorbike drivers in DKI Jakarta. In this research, the population size was enormous. Through this formula, the number of samples in this research is as follows (Lemeshow et al., 1997):

$$n = \frac{z^2 p(1-p)}{d^2}$$

Thus, the minimum number of samples (n) obtained is 384 respondents. The validity and reliability of the questionnaire indicators would be tested on the initial data. The analytical method used in this research is to test the hypothesis of each indicator on the latent variable using the PLS-SEM method which will be processed using the SMART-PLS software. The following are the hypotheses in this research:

H1 : The Positive Attitude variable has an influence on the intention to use a helmet for motorcyclists.

H2 : The Negative Attitude variable has an influence on the intention to use a helmet for motorcyclists.

H3 : The Subjective Norms variable has an influence on the intention to use a helmet for motorcyclists.

H4 : The Perceived Behavioral Control variable has an influence on the intention to use a helmet for motorcyclists.

H5 : The Perceived Susceptibility variable has an influence on the intention to use a helmet for motorcyclists.

H6 : The Perceived Severity variable has an influence on the intention to use a helmet for motorcyclists.

H7 : The Externality variable has an influence on the intention to use a helmet for motorcyclists.

H8 : The Internality variable has an influence on the intention to use a helmet for motorcyclists.

PLS-SEM will be used to process the data where it has several stages, such as evaluation of the measurement model (outer model) this test is used to show the relationship between constructs, and evaluation of the structural model (inner model) which is used to show the relationship between indicators and related constructs.

The steps taken in evaluating the measurement model are internal consistency reliability which is used to evaluate the reliability of the indicators to measure the construct by paying attention to the CR value ≥ 0.7. The validity test is divided into convergent validity and discriminant validity (Hair et al., 2014).

After evaluating the measurement model, the next step is the multicollinearity test, where there is a correlation between the existing constructs using variance inflation factor (VIF) criterion can be used in the multicollinearity test (Hair et al., 2014).

In contrast to the SEM method, which uses covariance as a basis, the PLS-SEM uses sample data to obtain the best parameters that can be predicted by the construct so that the PLS-SEM does not have a goodness of fit standard (Hair et al., 2014; Ringle et al., 2020).

The Coefficient of determination (R2) is a measure of the prediction accuracy of a model. R2 shows the magnitude of the variance in the dependent variable, while the decision for model assessment should be based on the adjusted R2 value (Hair et al., 2014). Cross-validated redundancy (Q2) is evaluate the predictive significance of structural models. The Effect Size value is calculated based on the changes in the test value of the coefficient of determination (R2). The Path Coefficient value is in the range of -1 to +1, meaning that if the path coefficient value is close to -1, there is a significant negative relationship, and vice versa; if it is close to +1, then there is a significant positive value.

RESULTS AND DISCUSSIONS

Recapitulation and Discussion of Demographic Data Processing Results

This demographic data was collected from 402 respondents to determine helmet use in DKI Jakarta. The result of the recapitulation of demographic data processing on 402 sample respondents is shown in Table 1.

Table 1 Recapitulation of Demographic Data

Demographic Data	Percentage of Respondents (N= 402)	Percentage of Helmet Use
Overall	100%	49.3%
Gender		
Male	58.5%	29.9%
Female	41.5%	19.4%
Ages		
17-25 Years	24.4%	10.9%
26-45 Years	68.7%	34.6%
46-65 Years	7%	3.7%
Level of Education		
Elementary school	0.5%	0.2%
Junior High School	0.5%	11.7%
Senior High School	24.4%	0.2%
Associate degree	14.4%	7.2%
Undergraduate	55.2%	27.1%
Graduate / Postgraduate	5%	2.7%
License Ownership Period		
3-5 Years	25.1%	10.4%
6-10 Years	39.1%	18.9%
11-15 Years	21.6%	11.9%
16-20 Years	7,20%	4%
> 20 Years	7%	4%
SNI Helmet Ownership Status		
Have SNI Helmet	98.8%	48.8%

Do not have an SNI Helmet	1.2%	0.5%
Reasons for Not Using a Helmet		
Close distance	61.7%	29.6%
Uncomfortable in Using a Helmet	11.4%	0.5%
Forget	26.1%	14.9%
Have No Helmet	0.7%	0.5%
Distance traveled when using a motorcycle		
< 2 km	15.7%	7.5%
3 km - 5 km	26.1%	10.7%
6 km - 10 km	25.1%	14.4%
> 10 km	33.1%	16.7%
Knowledge Related to the rules of Obligation to Have an SNI Helmet		
Yes	98.5%	48.8%
No	1.5%	0.5%
Counted Experience		
Yes	43%	20.6%
No	57%	28.6%
Accident Experience		
Yes	21.1%	11.9%
No	78.9%	37,3%

The level of helmet use in this research sample reached 49.3%, which is still relatively low compared to other countries that use motorbikes as a principal (Guritnaningsih et al., 2018); such as China only reached 34% (Suwannaporn et al., 2013), Iran only got 35% (Mirhossini et al., 2018). A similar condition is also found in DKI Jakarta, which is sufficient to say that there are still many motorbike drivers who do not use helmets when riding a motorcycle.

1. Gender

Based on the results of the respondents' analysis, the level of helmet use in this research are dominate by male drivers with 29.9% percentage compared to female motorbike drivers with 19.4% percentage. This supports the research conducted by Wu et al. (2019) which stated that the level of helmet use among male motorcycle drivers was higher than that of female motorcycle drivers. In addition, these results align with research conducted by Pinchumpholsang (2020) where motorbike riders of different sexes have different awareness, such as the characteristics and risk perceptions of male and female motorbike drivers. There is a widespread perception that men are more likely than women to take risks (Md Nor & Abdullah, 2014).

2. Ages

Age plays a crucial influence in the prevention of traffic violations (Truelove et al., 2017). The rate of helmet use among adults reached 34.6%, as determined by the data processing results of this research. This indicates that motorcyclists in adult age groups are likelier to wear helmets when operating a motorcycle than adolescents and seniors.

Adult motorcyclists tend to wear helmets, and more likely to be affected by the preventative effect of obeying traffic regulations more than adolescents (Kumphong et al., 2018; Truelove et al., 2017). These results also support MD Nor & Abdullah (2014) research, where teenagers tended to have a higher propensity to ride without crash helmets than those in other age groups.

3. Level of Education

Based on the results of this research, data processing shows that the helmet use rate among motorcyclists in Jakarta is higher among university graduates (37%; 12.1%). University-educated motorcyclists are more likely to have a solid education in terms of safety knowledge when operating a motorcycle. Education can significantly affect motorcyclists' habits, behaviors, and perceptions regarding accident risk. This conforms to the prevalent preventive regulations implemented in developing nations (Nadimi et al., 2021). Motorcyclists with a higher level of education have a greater awareness of law enforcement, legal regulation, and motorcycle driving behavior (Pinchumpholsang, 2020).

4. License Ownership Period

The research results showed that motorcyclists with a license for more than five years were more likely to use helmets while driving a motorcycle compared to drivers with a license for less than five years. There is a correlation between having a license and the amount of motorcyclist whom having more experience, which found that as motorcycle motorcyclists gain experience, their propensity to wear a helmet will increase (Bedru et al., 2022; Haqverdi et al., 2015).

5. SNI Helmet Ownership Status

In this research, it was determined that motorcyclists who own an SNI helmet are more likely to wear a helmet while traveling (48.8 percent among the 98.8 percent). The higher the rate of correct helmet use, the lower the risk of an accident involving a motorcycle driver (Kusumawati et al., 2018).

6. Reasons for Not Using a Helmet

The results of the data processing in this research showed that the reason motorcycle drivers did not use a helmet was dominated by a near distance, followed by other reasons that caused motorcycles drivers not to use the helmet forgotten, uncomfortable in the use of the helm, and have no helmet.

The findings also align with research conducted by Aidoo et al. (2018), which stated that more than a quarter of motorcycle drivers in the Kumasi region did not wear helmets because they did not travel long distances.

7. Distance travelled when using a motorcycle

Based on the data processing results in this research, it is informed that the longer the distance the motorcycle driver travels at the time of driving, the higher the percentage of intensive behavior of motorcyclists in using a helmet while driving.

This result is aligned with the research that conducted in Jamaica where the main reason not to wear a helmet is driving in close distances (Fletcher et al., 2019). More than a quarter of motorcycle drivers in the region do not use helmets when they travel in close distances (Nimako Aidoo et al., 2018).

The difference in behavior between motorcycle drivers over long distances and those over short distances is because motorcyclists perceive a greater risk of injury on long distances (Hung et al., 2008).

8. Knowledge Related to the rules of Obligation to Have an SNI Helmet

Based on the data analysis results of this research, 98.5% of respondents are aware of the mandatory helmet rule. Prior research has demonstrated that motorcyclists with a higher level of education have a greater awareness of motorcycle operating knowledge than those with a lower level of education (Pinchumpholsang, 2020).

9. Counted Experience

Based on the data processing results in this research, 43% of respondents claimed to have experienced ticketing, and 57% had no experience of being counted. Motorcycle drivers who have no experience of being counted tend to have a higher percentage of using helmets (28.6%).

These differences can happen because motorcycle drivers who do not have experience being ticketed tend to have general knowledge about the applicable law and the rules for using helmets.

10. Accidents Experience

In this research, 78.9% of motorcycle driver respondents said they had never had a motorcycle accident experience, while 21.1% had experienced being involved in a traffic accident. Motorcycle drivers with no accident experience tend to use helmets more often, with a percentage rate reaching 37.3% compared to motorcycle drivers with accident experience.

Even so, this is not in accordance with the general assumption, which states that drivers with accident experience tend to be more careful about driving safety by using a helmet to minimize the risks that occur in a traffic accident. So, it is necessary to have research focusing on this factor to avoid an imbalance in the number of research subjects.

PLS-SEM Construction Data Processing

This research uses the PLS-SEM method to process all the respondent's response data. The data is processing using the PLS-SEM method in several steps: model specification, evaluation of the outer model, and evaluation of the inner model (Hair et al., 2014).

Model Specification

In this segment, SMART-PLS model identification is based on two stages: evaluation of the measurement model to demonstrate the relationship between indicators and constructs, and evaluation of the structural model to demonstrate the relationship between the constructs to be evaluated. A research model specification shown in Figure 3.

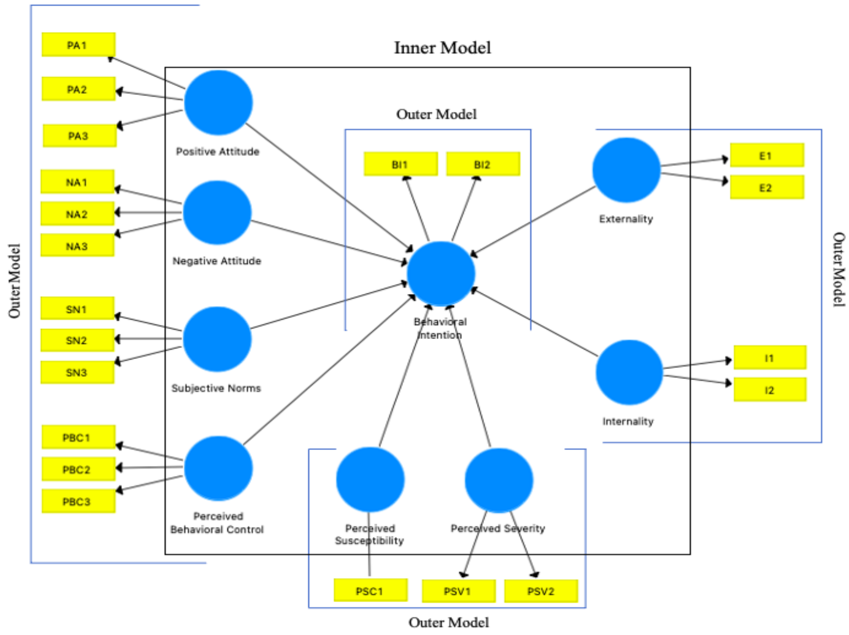

Figure 3. Model Specification

Outer Model Evaluation

According to the initial measurement model's evaluation results, several invalid and unreliable indicators exist. Therefore, invalid indicators are eliminated because their external loadings are less than 0.5, such as PA3, SN3, and PBC3. Meanwhile, the Perceived Behavioral Control (PBC) indicator is unreliable because its CR value is less than 0.70. The data for each structure's Composite Reliability value and the outer loading values of each indicator after repairs have been made and deemed dependable as shown in Table 2 and Table 4.

Table 2 Composite Reliability Model Value

Behavioral Models	Constructs	CR Values	Remarks
Theory of Planned Behavior (TPB)	Behavioral Intention	0,869	Reliable
	Positive Attitude	0,786	Reliable
	Negative Attitude	0,885	Reliable
	Subjective Norms	0,888	Reliable
	Perceived Behavioral Control	0,811	Reliable
Health Belief Model (HBM)	Perceived Susceptibility	1,000	Reliable

	Perceived Severity	0,873	Reliable
Locus of Control (LOC)	Externality	0,855	Reliable
	Internality	0,738	Reliable

Table 3 Outer Loading Model Values

Behavioral Models	Constructs	Indicator Code	Outer Loadings Value	Remarks
Theory of Planned Behavior (TPB)	Behavioral Intention	BI1	0,892	Valid
		BI2	0,862	Valid
	Positive Attitude	PA1	0,790	Valid
		PA2	0,819	Valid
	Negative Attitude	NA1	0,863	Valid
		NA2	0,826	Valid
		NA3	0,854	Valid
	Subjective Norms	SN1	0,909	Valid
		SN2	0,877	Valid
	Perceived Behavioral Control	PBC1	0,803	Valid
		PBC2	0,848	Valid
Health Belief Model (HBM)	Perceived Susceptibility	PSC1	1,000	Valid
	Perceived Severity	PSV1	0,920	Valid
		PSV2	0,839	Valid
Locus of Control (LOC)	Externality	E1	0,883	Valid
		E2	0,845	Valid
	Internality	I1	0,822	Valid
		I2	0,705	Valid

In addition, the convergent validity test considers the AVE value, declaring the construct valid if the AVE value is less than 0.5 (Hair. Jr et al., 2017). Based on the evaluation results of the initial measurement model, it can be concluded that the three indicators (PA3, SN3, and PBC3) are lack sufficient correlation with the construct being measured and invalid for assessing the construct.

Therefore, enhancements must be made by eliminating invalid indicators. It is necessary to improve by removing indicators that do not satisfy the minimum requirement. Based on the results of the improvement, it was reported that all constructs had an AVE value 0.5, whereas previously only the PBC construct had an AVE value 0.456; however, when PBC3 was eliminated, the AVE value increased to 0.682. So, it can be concluded the outcomes of these enhancements: all constructs can be declared valid. The AVE value data for each structure shown in Table 4.

Table 4 AVE Model Value

Behavioral Models	Constructs	AVE	Remarks
Theory of Planned Behavior (TPB)	Behavioral Intention	0,769	Valid
	Positive Attitude	0,647	Valid
	Negative Attitude	0,719	Valid
	Subjective Norms	0,798	Valid
	Perceived Behavioral Control	0,682	Valid
Health Belief Model (HBM)	Perceived Susceptibility	1,000	Valid
	Perceived Severity	0,775	Valid
Locus of Control (LOC)	Externality	0,746	Valid
	Internality	0,586	Valid

In consideration of the Cross Loading value, the results of the discriminant validity test reveal that one of the indicators, PBC3, has a lower correlation value with its latent variable (-0.116). In contrast, the Fornell Lacker indicates that all constructs have a higher correlation value than latent variables. Even though the value on the Fornell Lacker construct discriminant validity test meets the criteria, refinement is still required by eliminating indicators because the PBC3 indicator does not meet the test's criteria. After removing the PBC3 indicator, it is revealed that the indicators and constructs had a higher correlation than the latent variables as shown in Table 5 and Table 6.

Table 5 Cross Loading Model Values

	BI	E	I	NA	PBC	PSV	PSC	PA	SN
BI1	0,892	-0,006	0,325	-0,455	0,556	0,152	0,178	0,396	0,368
BI2	0,862	0,077	0,339	-0,362	0,466	0,223	0,275	0,365	0,291
E1	0,035	0,883	0,150	0,148	-0,067	-0,020	0,206	-0,055	0,042
E2	0,030	0,845	0,225	0,087	0,025	0,049	0,182	-0,007	0,012
I1	0,319	0,123	0,822	-0,198	0,391	0,441	0,121	0,371	0,174
I2	0,256	0,217	0,705	-0,049	0,175	0,207	0,323	0,099	0,068
NA1	-0,405	0,058	-0,170	0,863	-0,385	-0,065	-0,061	-0,310	-0,337
NA2	-0,370	0,156	-0,078	0,826	-0,435	-0,093	0,053	-0,326	-0,265
NA3	-0,414	0,142	-0,181	0,854	-0,425	-0,114	-0,079	-0,351	-0,217
PA1	0,337	-0,018	0,212	-0,264	0,344	0,204	0,122	0,790	0,233
PA2	0,361	-0,042	0,307	-0,358	0,427	0,285	0,161	0,819	0,229
PBC1	0,454	0,043	0,403	-0,273	0,803	0,326	0,106	0,413	0,189
PBC2	0,511	-0,081	0,239	-0,520	0,848	0,133	0,130	0,383	0,410
PSC1	0,255	0,226	0,274	-0,037	0,143	0,156	1,000	0,176	0,147
PSV1	0,212	-0,025	0,391	-0,111	0,248	0,920	0,093	0,279	0,033
PSV2	0,153	0,064	0,382	-0,072	0,229	0,839	0,201	0,259	0,043
SN1	0,360	0,056	0,143	-0,216	0,289	0,058	0,203	0,231	0,909
SN2	0,312	-0,003	0,153	-0,371	0,380	0,014	0,049	0,287	0,877

Table 6 Fornell Lacker Model Values

	BI	E	I	NA	PBC	PSV	PSC	PA	SN
Behavioral Intention	0,877								
Externality	0,038	0,864							
Internality	0,378	0,214	0,766						
Negative Attitude	-0,468	0,139	-0,171	0,848					
Perceived Behavioral Control	0,585	-0,027	0,383	-0,488	0,826				
Perceived Severity	0,211	0,014	0,437	-0,107	0,271	0,880			
Perceived Susceptibility	0,255	0,226	0,274	-0,037	0,143	0,156	1,000		
Positive Attitude	0,434	-0,038	0,325	-0,388	0,481	0,305	0,176	0,805	
Subjective Norms	0,378	0,032	0,165	-0,322	0,370	0,042	0,147	0,287	0,893

Path Modeling

The result of path modeling for both the Outer Model and the Inner Model using the SMART PLS software following the elimination of all invalid and dependable indicators shown in Figure 4.

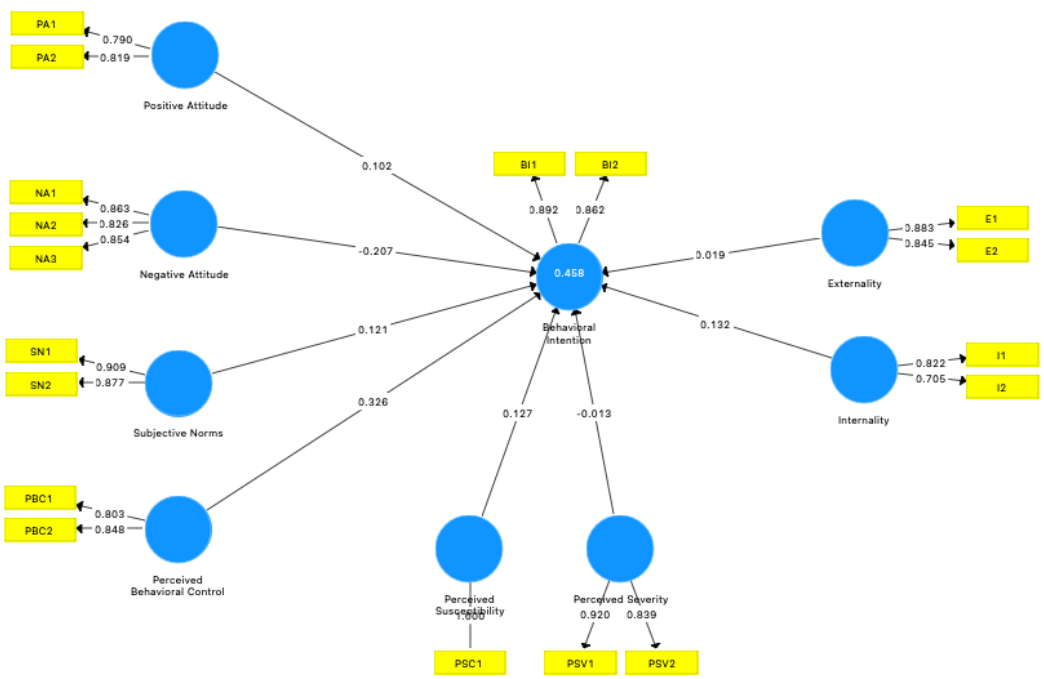

Figure 4. Path Modeling

Multicollinearity Test

The multicollinearity test determines the correlation between independent variables in a regression model utilizing the Variance Inflation Factor (VIF) value. The evaluation of the structural model of this research did not identify any multicollinearity issues for any of the indicators or constructs employed (VIF < 10).

Inner Model Evaluation

Several testing stages, including the Coefficient of determination (R2), Cross-validated redundancy (Q2), and Path Coefficient, are used to evaluate all hypotheses in the research when evaluating the structural model or the inner model. The outcomes of the R2 square and R2 adjusted test processing on the dependent variable in this investigation shown in Table 7.

Table 7 R2 Square and R2 Adjusted Values

Dependent Variable	R Square	R Square Adjusted	Remarks
Behavioral Intention	0,458	0,447	Moderate

The PLS Predict test measures a model's prediction accuracy by comparing the RMSE and MAE values between the PLS model and the linear regression model to determine whether the proposed PLS model has good predictive power and can predict changes in the endogenous variable, the predictive ability of the research model is moderate as shown in Table 8.

Table 8 Predict PLS Test Processing Results

Model	Dependent Variables	RMSE	MAE
Model PLS	BI1	1,022	0,704
	BI2	0,872	0,622
Model LM	BI1	1,032	0,727
	BI2	0,867	0,625

The Q^2 value is used to assess the predictive relevance of the structural model. In this research, the predictive relevance value of the structural model is moderate, so it can be said that the predictive ability of this research model is quite good. The processing results of the Outer Cross-Validated Redundancy (Q^2) test as shown in Table 9.

Table 9 Q^2 Test Result

Dependent Variable	SSO	SSE	Q^2	Remarks
Behavioral Intention	0,458	0,447	0,333	Moderate

Path Coefficient Evaluation

The Path Coefficient test data in this research determines that Internality, Negative Attitude, Perceived Behavioral Control, Perceived Susceptibility, Positive Attitude, Subjective Norms with a P-Value <0.05. In contrast, the Externality and Perceived Severity constructs have an insignificant relationship with a P-Value > 0.05. In addition, in this research, a significance test was conducted to ascertain the significance of each coefficient and test each of the research's hypotheses as shown in Table 1

Table 10 Hypothesis Test Results from Path Coefficient

Hypothesis	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values	Remarks

Externality -> Behavioral Intention	0,019	0,021	0,051	0,365	0,715	Not Significant
Internality -> Behavioral Intention	0,132	0,132	0,053	2,48	0,013	Significantly Positive
Negative Attitude -> Behavioral Intention	-0,207	-0,207	0,051	4,077	0,000	Significantly Negative
Perceived Behavioral Control -> Behavioral Intention	0,326	0,328	0,067	4,89	0,000	Significantly Positive
Perceived Severity -> Behavioral Intention	-0,013	-0,01	0,048	0,27	0,787	Not Significant
Perceived Susceptibility -> Behavioral Intention	0,127	0,125	0,048	2,622	0,009	Significantly Positive
Positive Attitude -> Behavioral Intention	0,102	0,105	0,047	2,169	0,031	Significantly Positive
Subjective Norms -> Behavioral Intention	0,121	0,120	0,047	2,582	0,010	Significantly Positive

Discussion of Hypothesis

Hypothesis 1: The Positive Attitude Variable has an influence on the intention to use helmets for motorcyclists.

The data processing results in this research model indicate that the independent variable, Positive Attitude (PA), positively affects the dependent variable Behavioral Intention (BI), it concludes that motorcyclists tend to have the intention to wear a helmet when driving due to the perceived or realized benefits of wearing a helmet. In this research, most motorcyclist respondents felt safer wearing a helmet while traveling. The results of this research are corroborated by the findings of Lajunen and Resanen (2004) and Champahom et al. (2019), who discovered that this variable significantly impacts the intention to wear a helmet.

Hypothesis 2: The negative attitude variable has an influence on the intention to use a helmet for motorcyclists.

This research model's data analysis results indicate that the independent variable Negative Attitude (NA) has a negative effect on the dependent variable Behavioral Intention (BI). It indicates that the intention of motorcyclists in DKI Jakarta to wear helmets decreases because of perceived driving obstacles. In this research, the factors that discouraged motorcyclists from wearing helmets were identified: discomfort and pain when using a helmet, a strange feeling when wearing a helmet alone when other people were not wearing helmets, and the feeling that the safety strap on the helmet made it difficult to breathe freely. The results of this research are supported by research conducted by Ambak et al. (2011), which indicates that the Negative Attitude variable influences the intention of motorcycle drivers to wear a helmet.

Hypothesis 3: Subjective Norms have an influence on the intention to use helmets for motorcyclists.

The research model's data analysis results indicate that the independent variable Subjective Norms (SN) has a positive effect on the dependent variable Behavioral Intention (BI). It indicates that motorcycle drivers tend to have the intention to wear a helmet when driving due to the input of the opinions of those closest to them. The variable of Subjective Norms has been shown to affect the intention to use helmets among motorcycle drivers in Thailand and Malaysia (Champahom et al., 2019; Yusuf & Oluwatoyin, 2019).

Hypothesis 4: The variable Perceived Behavioral Control has an influence on the intention to use helmets for motorcyclists.

The data processing results in this research model show that the independent variable, Perceived Behavioral Control (PBC), positively influences the dependent variable Behavioral Intention (BI). The results of this research are supported by previous research conducted by Lajunen and Resanen (2004) and Rezapur-Shahkolai et al. (2022) stated that the variable Perceived Behavioral Control has a statistically significant effect on the intention to use a helmet on motorcycle drivers, the variable Perceived Behavioral Control is the strongest predictor of the intention to use a helmet which indicates that respondents believe in personal control and their ability to use a helmet (Rezapur-Shahkolai et al., 2022).

Hypothesis 5: Variable Perceived Susceptibility has an influence on the intention to use helmets for motorcyclists.

According to the data processing results in this research model, the independent variable, Perceived Susceptibility (PSC), positively affects the dependent variable Behavioral Intention (BI). It implicates that motorcycle drivers in this research tend to have the intention to use a helmet when driving, which is influenced by the perceptual aspect of the estimated severity level that experiences without a helmet in the event of a motorcycle accident.

The variable Perceived Susceptibility is the only factor significantly affecting the intention to wear a helmet (Sissons Joshi et al., 1994). In addition, the results of this research corroborate the findings of Brijs et al. (2014), who stated that the perceived threat to this variable should not be ignored when attempting to predict helmet use. However, according to the research conducted by Lajunen and Rasanen (2004) and Ambak et al. (2011), the variable Perceived Susceptibility does not influence the intention to wear a helmet among motorcycle drivers.

Hypothesis 6: Perceived Severity Variable has an influence on the intention to use helmets for motorcyclists.

The outcomes of data processing in this research model reveal that the Perceived Severity (PSV) construct does not affect the Behavioral Intention (BI). In this research, even though motorcyclists believe that being injured in an accident due to not wearing a helmet can cause long-term health problems and income loss, this does not influence their intention to wear a helmet while driving. This research's findings contradict the findings of previous research, such as that of Kumphong et al. (2018), which suggests that the variable of Perceived Severity influences the intention to wear a helmet while riding a motorcycle. These differences may be due to the belief that helmets are unnecessary when traveling on a motorcycle safely (Karuppanagounder & Vijayan, 2016).

Hypothesis 7: The externality variable has an influence on the intention to use helmets for motorcyclists.

Based on the data processing results in this research model demonstrates that the Externality (E) construct does not have a proven effect on the Behavioral Intention (BI) construct. Even though most motorcyclists in this research believe that most motorbike accidents are not caused by car drivers, but rather by road conditions and their surroundings, this does not motivate motorcyclists to wear helmets while driving. The findings of this research contradict the findings of Lajunen and Rasanen (2004), who found that externality factors have a substantial impact on the intention to wear helmets.

The results of this research are supported by research conducted by Champahom et al. (2019), who found that the externality factor is one of the factors that does not affect the intention to wear a helmet. This result may occur if the motorcycle driver believes that he or she is not the cause of accidents for other people or believes that he or she can control the situation while driving a motorcycle.

Hypothesis 8: The internality variable has an influence on the intention to use helmets for motorcyclists.

The data processing results in this research model indicate that the Internality (I) construct positively affects the dependent variable Behavioral Intention (BI). In this research, the motorcycle drivers tend to have the intention to wear a helmet while driving, which influences the belief that events are the result of actions. The results of this research are supported by research conducted by Champahom et al., (2019) and Brijs et al., found that the Internality factor influences the intention of motorcycle drivers to wear a helmet.

According to research by Ghasemzadeh et al. (2017), it is possible to increase the use of helmets in the DKI Jakarta area by promoting and disseminating information about their benefits.

Goodness of Fit

In determining the suitability of the research model, a goodness-of-fit test was carried out on the PLS-SEM model using Standardized Root Mean Square Residual (SRMR) to avoid model specification errors (Henseler et al., 2016). SRMR values with a range between 0.08 - 0.10 in a more conservative version are considered suitable (Hu & Bentler, 1999).

The data processing results in this research show that this model has an estimated value of 0.085 SRMR model as shown in Table 11.

Table 11 SRMR Value Test

Fit Summary	Saturated Model	Estimated Model
SRMR	0,085	0,085

CONCLUSION AND RECOMMENDATION

Conclusion

Based on the results of data processing and analysis, it concludes that beliefs in their perceptions can control personal control and the ability to use a helmet (PBC) the perception aspect of the estimated level of severity that can be experienced in the event of a motorcycle accident (PSC), beliefs about the opinions of those closest to them (SN), the idea that the events that occurred the consequences of individual actions that can be controlled (I), and the benefits or benefits obtained from the use of the helmet (PA) is a factor that influences the intention to use a helmet on motorcycle drivers in DKI Jakarta with.

The empirical model in this research shows that the constructs of perceived behavioral control, subjective norms, and positive attitude are in the Theory of Planned Behavior behavior model. The perceived susceptibility construct in the Health Belief Model behavior model and the internality construct in the Locus of Control behavior model are independent variables that influence the behavioral intention to construct as the dependent variable in this research. Meanwhile, the negative attitude construct in this research had a significant negative relationship. This research's perceived severity and externality constructs proved to have no connection or influence on the intention to use helmets among motorcycle drivers in DKI Jakarta.

Recommendation

There are implementation suggestions to increase the intention to use helmets among motorcycle drivers in DKI Jakarta, including: (1) there is an application or reminder system connected to public service broadcasts that contain reminder messages about the importance of driving safety, especially in the case of helmet use, (2) there are vehicle inspections or the implementation of e-tickets at several minor road points to cover the entire small road area in the DKI Jakarta area, (3) there is an action in marking the driver's license of a motorbike driver who has been ticketed to make it easier to identify how often the driver violates by not using a helmet while driving, (4) the implementation of public service advertisements to various health units such as hospitals, health centers, clinics, and other health units is related to the benefits of using helmets and the impacts that occur if not using helmets for health, (5) conducting seminars or campaigns to increase safety awareness in riding motorbikes in schools and universities in DKI Jakarta, (6) implementing a safety riding training program, in which all residents in DKI Jakarta are required to attend this training within a certain period before having a motorcycle driving license, (7) provide education about the proper use of helmets, from how to use them to their benefits. This education can be conveyed by placing public service advertisements such as pamphlets and billboards spread evenly throughout the Administrative City of DKI Jakarta, such as at intersections, Samsat offices, small streets, every police post, and regional and city government offices.

FUTURE WORKS

The limitations of this research and recommendations for further research consist of three parts, including (1) direct observation was not carried out in this research due to limited resources and also conditions that did not allow direct observation; future studies should involve direct observation regarding the level of use of motorcycle helmets by using samples in several cities in Indonesia and not only centered in DKI Jakarta, (2) in this research only conducted an online survey; future studies should conduct the surveys online and offline to reach a broader range of respondents, both respondents who live in remote areas of the city of DKI Jakarta or respondents who have limited internet connections, (3) In this research, it does not count the passengers and only counts the motorcycle driver; future research should fulfil this consideration by taking the passengers who may also ride the motorcycle.

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