

Analysis of Driver Behavior Questionnaire Variables on Driving Safety: Literature Review

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Abstract

Driving safety is the driver's top priority when traveling. This is often done by using a means of transportation, namely a car, meaning that cars often have accidents in traffic, especially on freeways. This study aims to identify what variables were used by previous researchers in measuring the relationship between variables related to driving safety on the freeway; this is very closely related to driver habits and can be examined using the Driver Behavior Questionnaire (DBQ). The preparation of each question in the questionnaire has followed the standard questions in the preparation of the DBQ. This is what researchers hope to be able to do to analyze the variables needed for driving safety more quickly. The method used is a statistical analysis method that aims to provide an overview of the appropriate variables when researching driving safety cases. The results of the study show that there are 4 variables that are often used in research on driving behavior: aggressive violations, ordinary violations, errors, and deviations. These variables are often used in driving safety research.

Keywords:

Driving safety, Driver Behavior Questionnaire (DBQ), Driving behavior, Safety driving variable

1. Introduction

Accidents in driving are one of the causes of loss for those who experience them. This causes physical losses and can hinder the country's economic growth. Traffic accidents, especially on toll roads, are increasingly the main cause of death. One of the causes of accidents is driving behavior with a driving attitude that is not in accordance with applicable regulations, one of which is driving a vehicle at a speed that is not in accordance with the regulations. Accidents can be reduced by looking for factors that cause them. Studying these factors really helps drivers prepare for driving and is what is needed for researchers to find out how to reduce the occurrence of accidents. One tool that can be used is to measure the components of the accident by using the Driver Behavior Questionnaire (DBQ), which focuses on finding relationships between the involvement of the driver and the accident that occurred, namely by analyzing several characteristics of the driver and several variables related to accidents such as violations, errors, and irregularities (Jadaan, K et al. 2021).

Driver Behavior Questionnaire (DBQ) is the most well-known tool for assessing road user behavior; it is a tool in the form of a questionnaire for assessing risky road behavior. Recent research has raised several variables related to driving behavior. The Driver Behavior Questionnaire (DBQ) is known to assess risky road behavior among vehicle drivers. Problem behavior is a major determinant for safety outcomes in traffic. There are several findings that support the development of an instrument in this questionnaire that has been validated to assess at-risk drivers. taking into account drivers' task conditions before they drive, as per previous research supported by occupational researchers working in various corporate industries (Sergio, A et al. 2021).

Several studies have been carried out previously, including research on aggressive drivers. Behavior like breaking the rules on the toll road becomes a driver's habit, and this can certainly increase the risk of an accident, for example, intentional driving violations or driving skills that are not in accordance with driving rules, where both of these factors can endanger road users. Besides these two factors, there are also factors of irregularities and driving errors (Davey, J et al. 2007).

Of all the accidents that have occurred on highways, the driver behavior factor is the highest factor among several factors, namely vehicle speed, driver behavior, and perception. For that, one of the intervention programs to reduce the number of accidents in the group is to run public service ads that aim to increase the perception of fear.

However, there has been no study of what type of This intervention has been appropriately carried out in the driver group, as can be seen from the relationship of fear with the driving behavior of other motorists. And yet, conclusions exist about how fear affects not just behavior but also driving skills. Matter This is the goal of conducting research: to see behavioral trends and the influence of the fear factor on driving skills (Farah, H 2017).

Based on the background that has been described, the purpose of this research is to find out what variables are involved in conducting research on driving safety using the Driver Behavior Questionnaire (DBQ).

2.Literature

There is a lot of literature related to the Driver Behavior Questionnaire (DBQ) that has been submitted by previous researchers.

2.1 Driving theory

Driving is considered a chore and a complex activity that involves expertise in terms of cognitive, physical, sensory, and deep psychomotor processes at the same time. It takes maturity in terms of emotional and cognitive experience and an understanding of driving so that the person can drive safely in the face of conditions and an environment that may change during the drive (Caird and Kline 2005).

A driver's response to an external or internal influence while driving is defined as driving behavior. Which is behavior. Deviation in driving is divided into three categories: errors, lapses, and violations (Davey et al. (2007).

2.2 Factors Causing Accidents

There are three main factors that cause accidents, namely driver factors, vehicle factors, and environmental factors, which are basically closely related in the case of an accident. These causal factors are the key to knowing the next steps to reduce the occurrence of accidents in a study. With these factors, it can be known how to resolve and take steps in dealing with accident cases to reduce the number of accidents. Accidents are caused by several factors, including the bad behavior of drivers, other road users, vehicles, road conditions, weather conditions, and driver conditions. Driver behavior factors have an 80-90 percent influence on the occurrence of accidents and make the highest contribution in the case of accident (Jin, L et al. 2021). Driver behavior that is less organized towards other factors such as the environment, driving policies, and rules is a factor in the occurrence of accidents, where drivers can only run the vehicle without learning the bad risks of ignorance in driving (Petridou and Moustaki 2001). In the case of many accidents dominated by young drivers, they are at high risk of having an accident. Teenagers often do not care about the rules, regulations, and policies that apply to driving (Sullman et al.2012).

Factors such as speeding, recklessness, and exceeding the speed limit are factors that often cause accidents (Klauer et al., 2011), Besides that, there are factors that occur most often and play an important role in causing accidents, namely 28% of drivers are late to avoid objects in the road, 19% lose control of the vehicle, and 15% of drivers fail to give way to other vehicles. (Gyimah, N 2023).

In previous research, it can be concluded that the human factor is the biggest factor in causing traffic accidents. In addition, there are safety regulations that have been carried out by vehicle manufacturers so that driving safety is maintained, but drivers still make mistakes. The human factor is an influential factor, namely the perception factor (Yadegaridehkordi 2018). In addition to this, there are other factors that affect driving safety, including vehicle performance and driving behavior. Drivers who are not alert can cause accidents because their jobs require them to work all day, so a high level of caution is required. The level of alertness can be reduced due to driving fatigue after a while. The reduced level of alertness of the driver while driving can lead to accidents. Mileage in driving can cause fatigue effects and affect driver behavior in driving (Reason, J. 2000).

2.2 Perception of Fear

Emotional stability is one of the necessary behaviors for motorists. This emotional stability is the cause of mood swings. This emotional stability becomes one of the perceptions of motorists-the fear of driving. (Tandukar 2006). Unstable emotions often occur in teenage riders. Moods can change due to changing situations. The perception of fear is one of the factors that can affect the emotional stability of motorists (Reason, J. 2000). Fear is a response to threat and uncertainty, and is very dangerous for motorists. Fear is a variable in a threat management system that can help a person survive in life and death situations. Some of the links between fear for the safety of drivers is that safety and dangerous behavior in driving can occur from fear or anxiety. In improving road safety, the understanding of these emotional differences needs to be studied more deeply. Fear can increase the perception of danger or the driver's sense of security. With the emotion that is fear in driving, the possibility of safety for the driver is very high compared to no fear (Siebe C 2014).

2.3 Human error

Human error is a major factor in the occurrence of traffic accidents. Human error is a decision or action that is unnecessary or inappropriate and that can reduce or potentially reduce the performance, effectiveness, or security of a system. Human error can come from the behavior of drivers and drivers on the highway, perceptions, traffic patterns, driving skills, attention and concentration on the highway, social problems, and emotional problems. Human error is a deviation from predetermined performance standards that causes failure. Threats and risks to the safety of drivers are inseparable from human error, namely the lack of driving experience they have. Experience in driving becomes an obstacle that can increase the risk of an accident. This is because experience in driving leads to the degree to which the driver's ability to control his vehicle both in normal conditions and in sudden conditions that require a quick response is increased (Martinussen et al. 2022).

Driving is a job complex, so it requires skill and certain knowledge, because at that same driver must face the vehicle with his equipment and receive influence or stimulation from the environment. Several accidents have claimed lives lately it is often the result of loss driver concentration. Humans as drivers have factors both physiological and psychological. Human physiological factors that can affect events and accidents are the nervous system, vision, sadness, feelings of discomfort, others (touch, smell), and modification (tired, drug). Whereas psychological factors such as motivation, intelligence, experiences, emotions, maturity, and habits These factors need attention as they tend to be a potential cause of accidents (Sergio A, et al. (2021).

2.5 The Driver Behaviour Questionnaire (DBQ)

The Driver Behavior Questionnaire (DBQ) is a questionnaire for identifying driver tendencies and skills. This instrument has been widely used to carry out measurements and assess aspects of driver behavior that reflect risky actions, errors on the part of the driver, and deviations committed. The DBQ was developed in 1990 as a tool to assess driving behavior and lapses (Jeremy et al. 2007). Several studies have been conducted to determine driver behavior with this DBQ questionnaire, and many results have been obtained from the studies that have been conducted, which are very useful for safety perceptions and related studies in driving. This questionnaire has 28 behavioral items. consisting of 8 items for violations, 8 items for lapses, 6 items for ordinary violent, and 6 items for aggressive violent. The statements in this questionnaire are used to identify drivers who deviate from (Sharon, N, and Charlotte, F, 2012).

Factor analysis is often used to identify the building blocks of the DBQ typology. which refers to the deviant character of the rider. Found two to six factors that refer to DBQ typology. Comparison by typology is indeed difficult to do because of the background due to cultural and methodological differences different research. Previous studies used factor analysis with PCA and varimax rotation method. Another rotation method which can also be used is oblique rotation And Negative binomial regression (Kashani et al. 2016).

The research variables measured in this study were adopted from previous studies. In addition to measuring deviant behavior with the DBQ, sociodemographic, psychographic, and driving patterns are also measured, as in research. Sociodemographic aspects that are measured are domicile, area of origin, type of work, and status of residence. While the aspects of driving habits are driving distance, average speed on the highway, driving license, driving experience, and driving time, Respondents were also asked about their participation in safety. In addition, respondents were also asked about activities while driving, which could include telephone calls, SMS, listening to music, and other activities. Involvement in accidents and fines were also asked of the respondents. Psychographic aspects are measured on two variables, namely stress and thoroughness. Stress measures the level of stress among respondents who adopted the Psychological Stress Measure (PSM), where the last accident record was also asked of respondents, as well as who was at fault in accidents and the types of accidents based on involvement and position. In addition, we asked about the type of road and severity level. In the PSM, there are nine items that are measured, but only four items are selected. The measurement scale used is a Likert scale between 1 and 7, with the higher the score, the more frequent the frequency; the thoroughness variable is how logical a motorist is in making decisions when driving. The items were measured on adopted thoroughness and DBQ. In addition, driving habits are also measured in speed. The variable is named speed and consists of three items adopted from the DSQ (Driving Style Questionnaire) (Magali 2009).

The three subscales of the DBQ, violations, errors, and lapses, are there to measure various facets of driver behavior. For the purpose of measuring abnormal driving behaviors, DBQ with expanded infractions was utilized. Ten common violations, eight lapses, and eight errors are listed in the DBQ. A six-point scale with 0 being never, 1 being scarcely ever, 2 being sporadically, 3 being very regularly, 4 being frequently, and 5 being almost always is used to rate the 26 behaviors. The participants were asked to rate the frequency of each behavior by the research assistants (Kashani, et al. 2016).

3. Methods

This study uses the descriptive analysis method, in which the analysis is carried out on several reviewed articles to obtain similarities and differences in research results. There are several methods that can be used to analyze the data used in determining the variables in the Driver Behavior Questionnaire (DBQ). The method used is the use of a DBQ and demographic measurements combined into one questionnaire as part of a larger questionnaire, where drivers are asked to use a standard DBQ and continue with exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) to determine the suitability of the model (Martinussen et al. 2022).

Instruments are translated simultaneously, then the three results are compared, and finally, the analysis is carried out using semantic analysis. In this analysis, several items were described as the final instrument. The final questionnaire has 67 items to distribute and must be answered by respondents. A factor analysis was then carried out to determine the suitability of the DBQ variables used (Magali 2009).

Collecting data using a questionnaire to determine the opinions, perceptions, and experiences of respondents to know the nature and characteristics of respondents Data obtained through a questionnaire The type of questionnaire used is the Driver Behavior Questionnaire (DBQ). The questionnaire has statement items related to driving behavior and skills, with participants asked to respond to each item by indicating how often they behave as indicated. Respondents were asked to complete a DBQ questionnaire and rate the frequency with which they committed various types of errors and violations while driving. In addition, respondents were also asked to fill out a questionnaire about their perceptions of road safety and their perceptions of fear while driving (Farah 2017).

There are factors that influence risky driving behavior, namely aggressive violations, ordinary violations, errors, and lapses. Based on these factors, a questionnaire consisting of statements was prepared using the multi-categorical ordinal rating method. The choice in answering the available statements is determined by the Quantitative Analysis of Situational Awareness (QUASA) method and the Situational Awareness (SA) technique. DBQ is used to identify the driver's behavior while driving so that it can find out how the driver's behavior while driving can be distinguished from habits and other behaviors while driving (Reason 2000).

The results of the DBQ Questionnaire that have been filled in by respondents will then be analyzed using the regression analysis method assisted by the Statistical Packages for Social Sciences (SPSS) software. Regression analysis was chosen because in this study it will look for the relationship between the two research variables, namely the driver's behavior variable and the perception of fear variable.

4. Data Collection

The research data was collected from several research results, which consisted of the DBQ structure. The results of the collection of questionnaire variables developed, starting from two variables with 15 question items to four variables with 28 question items, according to the conditions of the case in the study. The complete data collected can be seen in Table 1.

Table 1. DBQ Data Structure

Author	Location	Population	Structure DBQ
Caird and Kline (2005)	Canada	190 corporate drivers (average age: 49 years, driving experience: 26 years).	15 items (two factors: violation and error)
Useche, et al (2017)	Columbia	540 drivers (mean age: 40.6 years, experience: 17.6 years)	21 items (two factors: violation and error)
Maslaic, et al (2018)	Serbia	504 certified professional drivers and 918 non-professional drivers (mean age: 35.12 years; driving experience: 14.16 years)	25 items (five factors: misconduct, casual offense, aggressive offense, positive conduct, and deviance).
Sullman, et al (2001)	New Zealand	382 truck drivers (mean age: 40.4 years; driving experience: 18.4 years).	28 items (four factors: error, violation, deviation, and aggressive violation).

Newnam and VonSchuckmann (2012)	Australia	248 drivers from community-based nursing organizations (mean age: 50 years).	20 items (three factors: mistakes, ordinary fouls, and aggressive fouls).
Sergio A, et al (2021)	Spanish	982 professional long-distance drivers, aged 48.51 years, from various provinces in Spain.	latent variables (violations, slips, and deviations), and eight observed variables (abbreviated as DBQ items).
Davey, et al (2007)	Australia	Respondents were 443 drivers; the average driver has had a license for 26 years and has driven a vehicle for at least 5 years.	4 latent variables (aggressive violations, ordinary violations, errors, and irregularities) with 18 question items
Kashani, et al(2016)	Iran	Respondent 514 Drivers are at least 18 years old, and their driving experience is at least 5 years.	4 variables (aggressive fouls, ordinary fouls, errors, and irregularities) with 28 question items
Jadaan K, et al (2021)	Jordan	Respondents were 200 randomly selected drivers, aged 22 and over. Respondents: 50 drivers	3 variables: violation, error, and deviation 10 common violation items, 8 deviation items, and 8 error items This has 26 behaviors.
Putranto and Alyandi (2019)	Indonesia	Respondents: 50 drivers	4 variables: aggressive behavior, ordinary violations, errors, and deviations, totaling 30 indicators.

5. Results and Discussion

The results and discussion of the research conducted are In determining the results of the questionnaire, the mean value is required in the DBQ questionnaire. Three actions are most often carried out by motorists, namely honking when disturbed by other road users. This is categorized as lapses, overtaking other motorists from the left lane, which is categorized as a general violation, and I realized that I don't remember much about the path I just walked, which is an error action category. Meanwhile, the three actions that were most rarely performed by this sample group were becoming angry with other motorists and chasing the driver to scold him, which were categorized as aggressive violations, and driving while drunk, which was categorized as an error (Farah 2017).

There are several different questions from several studies, which are then grouped based on the type of violation into 4 types of violation. The lightest violation is an error (an unintentional mistake), and the heaviest violation is an aggressive violation (breaking the rules). The violations that are often committed are ordinary violations, followed by aggressive violations. This shows that most of the drivers' habits involve deliberately committing traffic violations. The high level of this violation is also one of the causes of the high rate of accidents, while the highest form of violation is exceeding the speed limit, which affects the behavior of drivers who show very low social discipline to follow traffic rules (Martinussen et al. 2022).

Of the four factors measured in the DBQ, the factor that has the highest average score is slips and lapses. And error. It shows inclined riders committing an intentional violation. But it also shows that the rider has limited experience and often makes the wrong decisions while driving. Items that have the highest average score value are keeping the vehicle's speed up even though the other vehicle that was preceded has a high speed and overtaking other vehicles from the left; both items are factors in highway violations. Another item that has the highest average score is "keep driving even though you can't focus," so going the wrong way and nearly crashing were factors in slips and lapses (Kashani et al. 2016).

Validity and reliability tests were carried out on the questionnaires to be distributed. Validity indicates the extent to which the scores, values, and measurements obtained truly state the measurement or observation results to be measured. Reliability is an index that shows the extent to which a measuring instrument can be trusted or relied upon. The SA and DBQ questionnaires were declared valid after being tested for construct validity. The reliability

test was carried out using the split-half method. Both of these values can indicate that the questionnaire is reliable if the results of the questionnaire assessment have a value of more than 0.7 (Reason 2000).

This study was conducted using the DBQ Driver Behavior Questionnaire, which is widely accepted for analyzing driving behavior and has been recognized by the same researchers. Conducting surveys and asking how they behave is the simplest way to measure behavior effectively. Exploratory factor analysis (EFA) on the surveyed data showed that the categories of violation, error, and ignorance gave high scores for driving behavior. Furthermore, the reliability and validity of the model were tested using confirmatory factor analysis (CFA), which is also suitable for predicting behavior. The findings of this study emphasize a closer look at the DBQ as a popular and suitable instrument for analyzing accident rates.

The results of the analysis show that violations, errors, and ignorance can be significantly influenced by the nature of road users and driving experience. Drivers are younger and have less driving experience; they report inappropriate behavior. As we get older, the tendency for aggressive offenses increases, and the adrenaline rush also increases. However, drivers over the age of 45 showed the best driving maturity of any age. Male drivers reported significantly more violations, errors, and ignorance than female drivers. This is due to the experience of male drivers and the higher percentage of female drivers. Professional men who travel long distances per year are more courageous in their rides. The study also revealed that women are relatively safer drivers than men because they commit more mistakes than violations. Long-distance trips by drivers often result in fatigue problems such as difficulty focusing, little attention, drowsiness, loss of concentration, and constant yawning, which can significantly harm the driver. This greatly affects the mental processing and decision-making abilities of the driver. Workers and business people make more mistakes and violations; this needs to be addressed in further studies (Gupta et al. 2021).

6. Conclusion

The conclusions obtained from the results of the research that has been carried out are in determining the variables contained in the DBQ obtained from several initial studies including: there are actions that are most often carried out by motorists, namely sounding the horn when disturbed by other road users, overtaking / overtaking other motorists from left lane, and realized that I don't really remember the path I just walked which was categorized as lapses, ordinary violations, and errors respectively. While the actions that were rarely performed were getting angry at other drivers and chasing the drivers to scold them and driving while drunk were categorized as Aggressive Violation and Error respectively.

Another result is that the most common driving violations are ordinary violations or intentional violations. While the highest form of violation committed is exceeding the speed limit on the road, Based on correlation analysis, it was found that driving experience has a moderate correlation with driver behavior in the form of violators, while the number of accidents experienced by drivers has a low correlation with traffic violations by drivers.

Differences in distance characteristics also affect the level of alertness when driving, while driver behavior has almost the same character. Shorter mileage sometimes creates a less alert effect, but the reality is that drivers with closer mileage are more alert than those with longer distances. The level of fatigue in driving can be one of the factors that can reduce the level of alertness. Longer distances with work that is done repeatedly can cause fatigue more quickly.

Determining the factors and aspects that influence driver behavior in driving with DBQ based on research and information regarding the factors that influence risky driving behavior are as follows:

- a. Aggressive violations: have a relationship with aggressive interpersonal opinions.
- b. Ordinary violations: These violations do not have an aggressive purpose but are still intentionally committing opinion violations.
- c. Errors or mistakes are deviant behavior or mistakes made unintentionally.
- d. Lapses or deviations are a reflection of behavior related to memory problems and attention to opinions.

In the calculations using the DBQ, it was found that the results showed that the driver's assessment of their driving skills was reflected in their driving behavior, namely deviant driving. Additional studies can be conducted using qualitative methods such as focus group interviews to gain greater insight into thinking and behavioral motivation. In practice, research findings can support the development of a targeted DBQ aimed at addressing factors contributing to accidents. Leveraging DBQ and other assessment tools can provide a proactive organizational method to investigate the types of behavior exhibited by drivers and identify specific behaviors associated with violations. Significantly, the use of these measures can help develop a DBQ suitable for professional drivers that

aims to reduce the likelihood of an accident before it happens. Improvements to DBQ items can also make it easier for researchers to find out the basics and reasons for drivers to commit violations (Gupta et al. 2021).

References

- Caird, J. K., & Kline, T. J., The relationships between organizational and individual variables to on the job driver accidents and accident-free kilometres. *Ergonomics*, 47(15), pp. 1598–1613, 2004.
- Davey, J., Wishart, D., Freeman, J., Watson, B, An Application Of The Driver Behaviour Questionnaire In An Australian Organisational Fleet Setting, *Transportation Research Part F: Traffic Psychology and Behaviour* 10(1): pp. 11-21, 2007.
- Farah, H., The effect of positive and negative emotions on young drivers: A simulator study, *Transportation Research Part F: Traffic Psychology and Behaviour*, PP:1-23, 2017.
- Gupta, L., Goswami, S, and Kumar, R., Analysis of driver behaviours towards road safety measures using DBQ in the Indian context, *Transactions on Transport Sciences Peer-Reviewed Open Access Journal*, pp.12-18, 2021.
- Gyimah, N, Contributing factors to road accidents in Ghana, *Mathews Journal of Case Reports* · pp. 1-14, January 202.
- Jadaan, K., Albeetar, N., Abuhalmeh, D., Naji, Y, Analysis of driver behavior in Amman using Manchester Driver Behavior Questionnaire , *Acta Technica Jaurinensis*, Vol. 14, No. 4, pp. 440-454, 2021.
- Jeremy, D., Darren, W., James, F., & Barry, W, An Application of the Driver Behaviour Questionnaire in an Australian Organisational Fleet Setting. *Transportation Research Part F: Traffic Psychology and Behaviour*, 10(1), pp. 11-21, 2007.
- Jin, L., Guo, B., Jiang, Y., Hua, Q, Analysis on the Influencing Factors of Driving Behaviours Based on Theory of Planned Behaviour, *Hindawi: Advances in civil engineering*, pp: 1-13, 2021.
- Klauer, S, G., Morton, S,B., Lee, S, E., Ouimet, M, C., Howard, E, H., Dingus, T, A., Novice Drivers' Exposure to Known Risk Factors during The First 18 Months of Licensure: The Effect of Vehicle Ownership. *Traffic Injury Prevention*, 12(2), 159–168, 2011.
- Magali, H., Veiga, S., Driver Behavior Questionnaire – Qcm: Adaptation and Validation for the Brazilian Reality, *Psychological Assessment*, 8(2), pp. 187-196, 2009.
- Martinussen, Marianne, L., Blomqvist, H., Liisa, Mette, M., Türker, o., ; Tim, L., Age, gender, mileage and the DBQ: The validity of the Driver Behavior Questionnaire in different driver groups, *Accident Analysis & Prevention*, PP. 1-26, 2022.
- Masla'c, Marko, Anti'c, Boris, Lipovac, Krsto, Pe'si'c, Dalibor, & Milutinovi'c, Nenad (2018). Behaviours of drivers in Serbia: Non-professional versus professional drivers. *Transportation research part F: Traffic psychology and behaviour*, 52, 101–111.
- Newnam, Sharon, & VonSchuckmann, Charlotte (2012). Identifying an appropriate driving behaviour scale for the occupational driving context: The DBQ vs. the ODBQ. *Safety science*, 50(5), 1268–1274.
- Reason, J., Human error : *models and management*, Vol. 320, no. March, pp. 4–6, 2000.
- Sergio, A., Useche, Boris Cendales, c., Ignacio Lijarcio, b.e., Francisco, J., Liamazares, d, Validation of the F-DBQ: A short (and accurate) risky driving behavior questionnaire for long-haul professional drivers, *Transportation Research Part F: Psychology and Behaviour*, 82: pp. 190–201, 2021.
- Sharon, N, and Charlotte, F, Identifying an appropriate driving behaviour scale for the occupational driving context: The DBQ vs. the ODBQ. *Safety science*, 50(5), 1268–1274, 2012.
- Siebe, C., Distracted driving and risk of road crashes among novice and experienced drivers, *e Journal of Emergency Medicine*, vol. 46, no. 4, pp. 54–59, 2014.
- Sullman, M. J. M., Thomas, A., Stephens, A. N. The road user behaviour of school students in Belgium. *Accident Analysis and Prevention* 48, PP. 495–504, 2012.
- Sullman, Mark J. M., Meadows, Michelle L., & Pajo, Karl B. (2001). Aberrant driving behaviours amongst New Zealand truck drivers. *Transportation Research Part F: Traffic Psychology and Behaviour*, 5(3), 217–232.
- Tandukar, P, K., Nakahara, S., Ichikawa, M., Poudel, K. C., Wakai, S. Relationship Between Mechanisms and Activities at The Time Of Pedestrian, *Injury and Activity Limitation Among School Adolescents in Kathmandu*, Nepal. 2006.
- Petridou, E., and Moustaki, M, Human Factors in The Causation of Road Traffic Crashes. *European Journal of Epidemiol*, 16, pp. 819–826, 2000.
- Putranto and Alyandi (2019), The Relationship Between Children Education in the Family and Car Driving and Motorcycle Riding Behaviour in Indonesia, *The International Journal of Integrated Engineering*, VOL. 11 NO. 6 (2019) 254–267.
- Useche, S. A., Ortiz, V. G., & Cendales, B. E. (2017). Driver Behavior Questionnaire-Modified (DBQ) [Database record]. *APA PsycTests*. 2017.

Yadegaridehkordi, M, H, E., Nasir, N, B, M.,N., Noor, M, B., Shuib, L., and Badie, N Predicting the adoption of cloud-based technology using fuzzy analytic hierarchy process and structural equation modelling approaches, *Applied Soft Computing*, vol. 66, pp. 77–89, 2018.