

## Countermeasures for Enhancing Road Traffic Safety for Motorcycle Users in Vietnam: Findings from The Focus Groups and In-Depth Interviews Studies

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**Abstract:** The purpose of this study was to understand the causes of traffic accidents related to motorcyclists and from which can provide solutions to enhance traffic safety best suited for motorcyclists. This study conducted the in-depth group discussions with twenty-nine participants to define the root causes and countermeasures to enhance traffic safety for motorcyclists from the viewpoints of different road users and the authorities. Besides, the in-depth interviews conducted with two traffic police to define the important and urgent solutions for reducing the traffic accident related to motorcyclists. The improvement suggestions proposed include engineering intervention, enforcement solution, and education and training countermeasure. While the improvement of driving skills for motorcyclists is the most significant and urgent criteria in Vietnam. These findings imply that the driving training programs for the motorcycle driver need to be adjusted and updated to improve traffic safety for motorcyclists.

**Keywords:** Traffic Accident, Motorcyclist, Focus Group, Training Program

## 1. INTRODUCTION

In 2016, according to Vietnam statistics, there are more than 45 million motorcycles and motorcycles of all kinds, with an average of two Vietnamese people owns a motorbike (VAMM, 2017). Currently, 85% of Vietnam's population is using motorcycles as the main means of transportation, as well as a means of daily living. Due to the asynchronous development of transport infrastructure with population growth and economic development, people's demand for motorbikes has increased. Affected by the sudden increase in the number of motorcycles and high travel demand, the number of traffic accidents in the past years tended to increase in the number of serious traffic accidents, the number of dead in traffic accidents. According to the NTSC (2016) report, motorcycles cause more than 70% of road

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traffic accidents. The main causes of traffic accidents related to motorcycles by the risky behaviors of motorcycle drivers (86%), the other causes related to driving environment such as bad roads, rain, evening accounted for 14%. To understand the causes and from which can offer solutions to improve traffic safety best suited for motorcyclists, there is a need for a direct and in-depth study on traffic safety with motorcycle drivers, especially those who have been involved in traffic accidents. Furthermore, collecting opinions from experts, managers, authorities, automobile drivers and motorcycle riders are necessary to have a general understanding on road traffic accidents related to motorcyclist.

The study on the risky behavior of motorcyclists based on the expert focus groups and interviews experts in road traffic safety in the HCMC and Binh Duong province, include two main parts, the first part focuses on the need assessment of risky behaviors of motorcyclists, and the second part studies on the workable and effective countermeasures to reduce the risky behaviors of motorcycle drivers. This paper presents the study on the workable and effective countermeasures to reduce the risky behaviors of motorcycle drivers in Vietnam. The combination of in-depth group discussions and expert interviews will reveal the underlying causes of motorcycle-related traffic accidents and thus capture the inadequacies related to traffic safety for motorcyclists from different angles. These results were used to identify the needs for further studies in road safety enhancement for motorcyclists in Vietnam.

## **2. METHOD**

### **2.1 Focus Group Interviews**

Focus groups as a research method originated in the work of the Bureau of Applied Social Research at Columbia University in the 1940s (Bloor 2000). Focus group have been defined as “the label given to a special type of group interview that is structured to gather detailed opinions and knowledge about a particular topic from selected participants’ (Gloria E. Bader, 2002). A focus group is not just gathering a group of people to talk. The focus group is a gathering of a special group in terms of purpose, size, composition, and procedures to discuss and gather information to understand how people feel or think about an issue (Krueger, 2002). The qualitative perspective of the focus group provides the crucial importance and necessary data for the design of subsequent quantitative studies in the next steps, which will be able to focus on truly relevant issues when analyzing the topic with a larger population (Véronique Huth, 2014). Expert focus group was used in the study of the distraction driver in 2010 of The US-EU Bilateral ITS Technical Force. Expert focus group is a focus group meeting with a small group of selected experienced motorcyclists or experts in road traffic safety for motorcycle drivers to discuss on the general and specific information to get a breadth and depth understanding on the risky behaviors of motorcyclists.

### **2.2 In-depth Interview**

The in-depth interview as a method of qualitative empirical research, designed to explore expert knowledge, has been developed considerably since the early 1970s. The in-depth interview is an interview with any interviewee who in terms of the current purposes of the interviewer is given special, non-standardized treatment (Dexter, 1970). An in-depth participant has the undivided attention of the interviewer and subjects can be explored in more detail. Another consideration for conducting in-depth interviews is it is sometimes easier to

recruit participants to commit to an in-depth interview rather than a focus group, as there is more flexibility in scheduling and often does not require any travel by the participant. Conducting in-depth interviews can serve to shorten time-consuming data gathering processes, particularly if the experts are “crystallization points” for practical insider knowledge and are interviewed as surrogates for a wider circle of players (Bogner et al., 2009). The in-depth interview has become very popular as a “streamlined” method: recruiting informants does not seem to cause any difficulties, as a method the expert interview appears to be “quick, easy, and safe” in its application, and it promises to be of good practical value (Bogner et al., 2009). The in-depth interview of this study focuses on the discussion for the wrong viewpoints of participants when driving and the ability to interact with other road users from the perspective of people who has many experience in traffic safety for motorcyclists.

## 2.3 Procedure

The moderator overview the objective of the study is to learn more about motorcyclists’ behaviors related to certain situations and to explore the underlying reasons for this behavior. The participants will be informed that their information used to explore a deep knowledge on the attitude and behavior of motorcyclists in crashes, and their suggestion used to enhance the traffic safety for motorcycle drivers. The participants also reminded that there are no right or wrong statements and that any information is welcome, including opposed opinions with the general way of thinking.

## 2.4 Participants

The focus group study includes the two main groups, the first main group is the motorcycle-related group and the second group is the expert group. The motorcycle-related group have four subgroups named experienced motorcycle driver; novice motorcycle driver; automobile driver (car, bus, truck); bicycle and electric bicycle rider. The expert group have two subgroups includes motorcycle trainer; and policymaker. Each subgroup has from 3 to 7 people with age and occupation depend on the group they participate in the discussion (Table 1). In order to understand deeply the causes of traffic accidents and proposed solutions to improve traffic safety for motorcyclists, this study chose participants of the experienced motorcyclists used to have the traffic accidents in the past 05 years.

Besides the focus group study, this study also takes an expert interview with the two traffic police leaders to explore road traffic accidents related to motorcycle from the viewpoint of people have in-depth understands and experiences on traffic accidents related to motorcycle, and to explore the most suitable countermeasures to enhance road traffic safety.

Table 1. Group of participants

Group			Number	Remark
Focus group discussion (FGD)	Driver group	Experienced motorcyclist (EM); (EM: 3, CD: 1, NMR: 1)	5	3 motorcyclists and 1 motorist had accident in the last 36 months
		Novice motorcyclist (NM); (NM: 5, CD: 1, NMR: 1)	7	1 motorcyclist and 1 motorist had accident in the last 36 months
		Bicyclist/E-bike rider (NMR); (NMR: 4, EM: 1)	5	2 bicyclists and 1 motorcyclist had accident in the last 36 months
		≥4-wheelers vehicle driver (CD); (EM: 1, CD: 3)	4	1 motorcyclist had accident in the last 36 months
	Expert group	Motorcycle trainer (MT)	3	Motorcycle, car and truck trainers
		Policymaker/ Authorities (PA)	5	Binh Duong DOT

In-depth interview (IDI)	Traffic police (TP)	2	Lieutenant colonel, Leaders of traffic police department
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Participants in groups were discussed on the contents based on the designed framework (Table 2). There are 04 main contents include (1) demographic information, (2) discuss on dangerous causes of TA and causes may increase danger level, (3) discussion on accident cases in proposed videos and photos, (4) recommendations of participants to improve traffic safety for motorcyclists. The interview conducted with the traffic police focusing on the questions related to the current inadequacies related to motorcycle users and recommendations to improve the traffic safety for motorcyclists.

Table 2: Questionnaire distribution to participants

No.	Question	EM	NM	NMR	CD	MT	PA	TP
1	Demographic information	✓	✓	✓	✓	✓	✓	
2	Discuss on dangerous causes of TA and causes may increase danger level	✓	✓			✓	✓	
3	Discussion on accident cases in proposed videos and photos	✓	✓	✓	✓			
4	The current inadequacies and recommendations to improve traffic safety for motorcyclists	✓	✓	✓	✓	✓	✓	✓

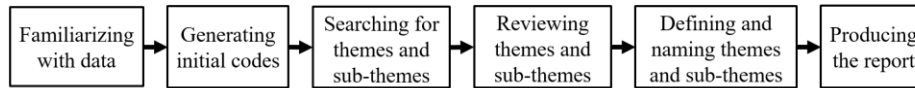
## 2.5 Tools

A topic guide for the qualitative study drew up before the discussion to evoke the research themes. The guide includes a list of topics the moderator wishes to discuss on the risky driving situations, the interaction with other drivers, the hazard perception of drivers, and the improvement needs for driving safety. Furthermore, the moderator use the more detailed guidance to explain to the participants when they are unable to understand the questions.

A list of questionnaires prepared to get the detailed demographics of each participant. A bundle of risky behaviors designed to get the evaluation of participants on the riskiest behaviors based on their experience. A list of short videos and photos used to describe the risk-taking behaviors of motorcyclists, environment-related hazards to riders, conflicts and interactions with other road users to support participants can imagine the questionnaire's contents. The riders will be also asked to judge the behavior seen in the videos, explain how they behave in similar contexts, suggest how to deal with the risky behaviors that they could meet when riding, and countermeasures should be applied to decrease traffic accidents related to motorcyclists. A list of opening questions drew the participants into a discussion on their driving experiences, the traffic accidents related to motorcycle riders in the past, and further sub-questions were optionally given to guide the participants towards the research objectives. This semi-structured pattern allows the conversation to naturally flow beyond the given questions and leaves room for emerging additional topics (Véronique Huth 2014).

## 2.6 Analysis Procedure

First, the main content of notes during the focus group must compare with the audio tapes to ensure the similarity of the notes and the audio tapes, and to make sure the important information is missed by stenograph of the moderator.



Source: Adopted from (Braun 2006)

Figure 1: Six systematic analysis steps on focus group

The analysis adopted the six systematic steps based on the method described by Braun (2006). The analysis involves a constant moving back and forward between the entire data set, the coded extracts of data that are analyzing, and the analysis of the data that are producing (Braun, 2006).

### 3. FINDINGS

The Atlas.ti software (Version 7.0) is used for coding, analyzing the data and producing the study result.

#### 3.1 Severity Level of Accident Causes

The severity level of the 13 causes studied based on experience of participants. There are 29 answers of participants on the ranking of dangerous causes. Participants selected risk behaviors and influential factors in descending order of 13 behaviors. The ranking results showed the “Drink-driving”, “Speeding”, and “Lacking of attention” are the three most dangerous causes. The “Unsafe motorcycle”, “Pedestrian at fault” and “Traffic environmental impact” are the three less dangerous causes.

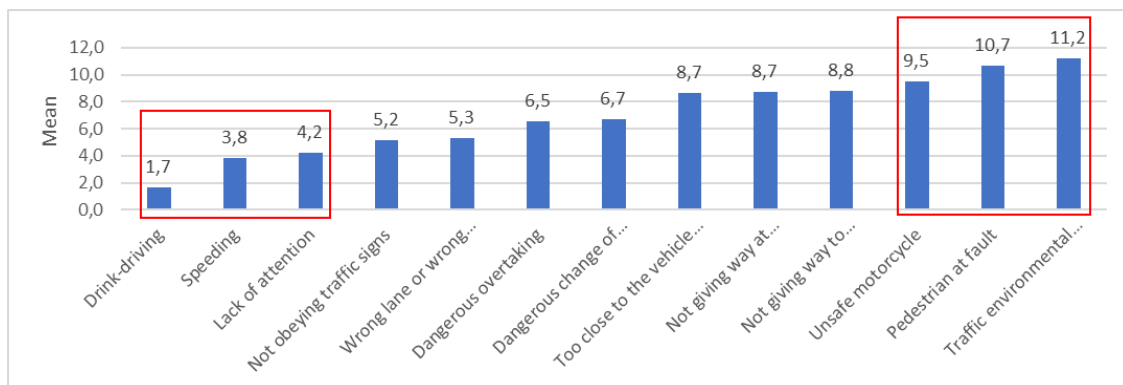


Figure 2: The ranking of severity level of dangerous causes

#### 3.2 Countermeasures for Cutting Down the Leading Risky Behaviors

Drink-driving, speeding and lacking of attention are the three leading causes of traffic accidents related to motorcycle users. To reduce the number of accident and the dangerous level of traffic accidents related to the risky behaviours that come from drink-driving, speeding and lack of attention behaviours of motorcyclists, a video discussion conducted with 14 participants. This part presents the countermeasures suggested by participants to reduce the leading risky behaviors on road.

The countermeasures for motorcycle drivers to avoid collision with drink-driving, speeding and lack of attention behaviors of other traffic users have the same two themes, and several sub-themes. The first theme embraces the vehicle control of motorcycle drivers and the second theme discuss on the appropriateness behavior of motorcyclist should apply to

avoid collision with the risky behaviors of other drivers.

Countermeasures related to the driving behaviors include “giving way”, “paying a close attention” and “keeping a safe distance for drivers doing risky behaviors”. Countermeasures related to the driving behaviors are the basis for motorcyclists controlling the motorcycle in the best way of avoiding collisions.

*“Always pay attention when driving, usually check the rearview mirrors to have enough time to define and give way for the vehicle behind driving at high speed and trying to overtaking. Reduce speed to give way for the distracted motorcycle drivers overtaking. Drive next to the roadside to give way for the drunk driver.”* (P.16, Male, NMR, FGD)

*“Reduce speed and give way for the vehicle behind driving at high speed and trying to overtaking. Sound the horn to alert a driver who lacking attention and reduce the speed. Increase speed to overtake or reduce speed to give way for the drunk driver.”* (P.19, Male, CD, FGD)

Regarding the vehicle control of motorcycle drivers, the focus group participants reveal countermeasures to avoid accidents with the three leading causes on road. According to them, the countermeasures to avoid traffic collision with the risky behaviors of other drivers includes “reducing speed”, “increasing speed”, “driving next to the roadside” and “sounding the horn to alert”.

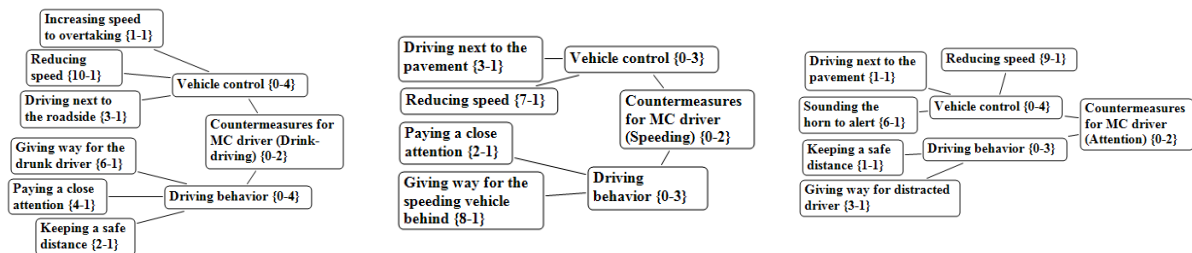


Figure 3. Countermeasures for motorcycle drivers to avoid risky behaviors of other motorcycle drivers

The countermeasures for local government to enhance traffic safety for motorcycle users to avoid collision with drink-driving, speeding and lacking of attention behaviors of other traffic users have the same three themes, and several sub-themes. The first theme discusses on the engineering countermeasures should utilize to reduce the risky behaviors of drivers. The second theme deals with the education and training countermeasures to improve the motorcycle users' behaviors. Finally, the suggestions of participants on the changing and updating the current traffic law in Vietnam to reduce the top risky behaviors of motorcycle users on road.

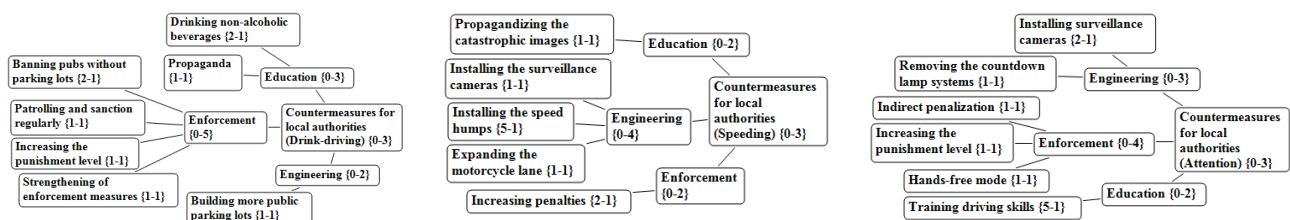


Figure 4. Countermeasures for road safety authorities to cut down risky behaviors

When referring to solutions to dramatically reduce the behavior of leading road safety, the engineering solutions are most commonly mentioned by the participants. To reduce drink-driving behavior, the road safety authorities need to build more public parking for motorcycle. Participants explained that nowadays one of the reasons that drink-driving behavior persists, especially motorcyclists, is that after using the alcoholic beverages in the restaurants, bar, diners will often have no overnight parking, so these diners have to drive themselves home.

*“Need to build more public parking. Install the speed humps and surveillance camera systems at the road segments that motorcycle drivers usually exceed the speed limit.”* (P5, Female, NMR, FGD)

According to the participants, the speeding behavior is done for two main reasons, one is due to the behavior of motorcycle users, in order to cut down this reason, the proposed engineering solutions are “installing the surveillance cameras” and “installing the speed humps” on roads. The second reason motorcycle drivers do the speeding behavior is because lane motorcycles are small compared to current traffic, so to be get on time when going to work, motorcycle drivers need to encroach on the car lane, which when running on the car lane, the motorcyclists must run fast as the speed of cars running on the road. The proposed solution for this problem is to expand the motorbike lane to match the current motorcycle volume in Vietnam.

*“Install surveillance camera systems on road to define and penalize the mobile phone use behavior of motorcycle drivers, to enhance the consciousness of motorcycle drivers.”* (P1, Male, CD, FGD)

The countdown timer traffic lights may impact to motorcyclist when they enter the intersections. Motorcycle drivers focus on the countdown timer, so they do not pay attention to the vehicles ahead, or the sudden traffic incidents may occur on the road. Removing the countdown timer traffic lights at intersections is a countermeasure to avoid the lack of attention of motorcyclists at intersections.

*“Remove the countdown lamp systems at signalized intersections, because motorcycle drivers usually focus on the final seconds of the countdown lamp, they do not observe and pay attention to the vehicles and traffic environment around them.”* (P2, Male, CD, FGD)

The education and training solutions discussed by the participants include the propaganda and educational solutions and skills training for motorcyclists. To reduce drink-driving behavior, the solutions related to education include encouraging diners to use non-alcoholic beer instead of alcoholic beverages when they self driving back home. The second solution was to promote the use of pictures of traffic accidents with catastrophic consequences related to alcohol abuse by motorcyclists. This is also the solution that participants propose to reduce the speeding behavior. In relation to the lack of attention behavioral education solutions, participants proposed the local authorities need to adjust and update more content needed in the training, and testing to reduce the risks may come from the distraction of motorcycle drivers.

*“Encourage people to drink non-alcoholic beverages.”* (P17, Male, EM, FGD)

*“Propagandize the catastrophic images of traffic accidents due to speeding behaviors on the mass media, especially in magazines, websites that have the highest number of visitors in Vietnam; the websites that young people often have access; the free calling and texting services in Vietnam such as Zalo, Bingo, etc. Install the large catastrophic traffic accidents images on the roads that often occur the speeding behaviors of motorcyclists.”* (P3, Male, CD, FGD)

*“Train the mobile phone use skills to motorcycle drivers who need to use the mobile phone when driving. The mobile phone use when driving is necessary for many people for the jobs, for their living.”* (P17, Male, EM, FGD)

The enforcement solution, the common countermeasure for all three behaviors is increase the punishment level. In addition, the drink-driving behavior and lack of attention have some additional solutions from the opinions and viewpoints of the participants. The other solution for drink-driving behavior is to ban restaurants and pubs that do not have overnight parking for diners. The traffic police must regularly monitor and punish drink-driving, and revising traffic laws to increase the fines for drink-driving behavior of motorcyclists. The lacking of attention behavior in which the distraction by the phone use is the main cause, motorcyclists use the phone while driving is very common in Vietnam. In addition to the increase the punishment level for the lacking of attention behavior, other measures to reduce this behavior include indirect penalization and mobile phone hand-free mode using, in which indirect penalization is the traffic police punish this risky behavior base on the data collected by the surveillance camera on the road. The use of a mobile phone while driving is a prohibited activity in Vietnam, however, many people still using due to their livelihood. Therefore, it is almost impossible to strictly prohibit this behavior. The solution proposed by the participants is allowing the motorcyclist using mobile phone while driving in the hands-free mode.

*“It is obligatory to the pubs and restaurants need to have parking lots for dinners after drinking.”* (P4, Male, EM, FGD)

*“Strengthening of enforcement measures. Regular patrols and sanctions in the areas around the pubs and restaurants.”* (P21, Male, EM, FGD)

*“Increase the indirect penalization on the risky driving behaviors by lack of attention of motorcyclists based on the recorded data of the surveillance cameras on roads.”* (P5, Female, NMR, FGD)

*“Encourage motorcycle drivers to use the mobile phone in the hands-free mode.”* (P1, Male, CD, FGD).

#### **4. DISCUSSION**

The combination of focus group study and in-depth interview in this study revealed the stories behind participants' experiences and viewpoints that are not detectable by the quantitative studies, observational studied or statistic data from traffic police.

Drink-driving, speeding and lack of attention are the three leading causes in road traffic accidents related to motorcycle drivers in Vietnam. Whereas, the drink-driving



behavior is the most dangerous cause in the three leading causes. Under the impact of alcohol, the motorcycle novice drivers tend to drive at higher speed than the experienced drivers in the rural areas (Filtness et al., 2013). In the traffic accidents related to drink-driving behavior, motorcyclists have higher injury rates than car drivers due to the high vulnerability of motorcycle driver compared with the automobile drivers (Sun et al., 1998). As the vulnerable driver, motorcyclists more often involved in the crashes at the low BAC than car drivers, this due to the need for greater coordination and balance when controlling a two-wheeled vehicle (Sun et al., 1998). The result of a petrol station interviews reveals the possibility of accident of the drunk motorcycle driver is 2.7 times higher than when they are not under the alcohol influence (ACEM, 2009).

In order to avoid traffic-safety behaviors, especially the group of three most dangerous behaviors, motorcyclists must always pay a close attention to be able to identify and handle dangerous situations in a timely manner. When meeting the risky driving activities of other traffic users, motorcycle drivers need to slow down their vehicle and give way to drivers with dangerous behavior on the road. To cutting down the drink-driving behavior, the local government should encourage dinners use the non-alcoholic beverage and banning the pubs without parking lots for dinners after drinking beer or wine. Training the skills for the servers of bars, pubs to encourage dinners using non-alcoholic beverages, avoiding serve alcoholic beverages for underrated drinkers. The dinners served by the trained servers reached lower BACs than dinners served by untrained servers (Russ and Geller, 1987). Installing the speed bumps and humps at places where motorcycle drivers often speeding is one of the efficiency countermeasures to reduce the speeding behaviour of motorcyclists. Reducing vehicle speeds is one of the most effective interventions to stem traffic crashes. However, setting lower speed limits is not an effective intervention without the traffic law enforcement resources to ensure that limits are followed. Speed bumps and rumble strips are the most popular speed calming devices to reduce driver's speeding behavior (Afukaar, 2003). The use of mobile phone when driving is popular in Vietnam, partly due to the subjective sense of the motorcycle rider, partly due to the livelihood of the driver (e.g. Uber motorcycle drivers, motorcycle shippers, etc.). The absolute ban on the use of mobile phones for motorcyclists is almost impossible. Therefore, it is necessary to teach mobile phone users the skills necessary to use the mobile phone when driving, especially those who regularly use when driving the motorcycle (e.g. Uber motorcycle drivers, motorcycle shippers, etc.). The physical distraction of hands-free phone using is less than the handheld mobiles using (Törnros and Bolling 2005). Using a hands-free mobile phone while driving is more safety than handheld mode (White et al., 2004).

## **5. CONCLUSION**

The results of the study provide a concrete picture of the necessary and appropriate solutions to improve road safety for motorcyclists with the typical characteristics of transport infrastructure and traffic user's behavior in Vietnam. The most important and urgent countermeasure is the adjusting and updating the driving training for the motorcycle driver to increase the motorcycle controlling skills, the skills for recognizing and handling dangerous situations on the road. Besides, there need further detailed studies to provide the comprehensive information for traffic safety authorities to promulgate the suitable adjustment in increasing the fines and enforcement levels to the three leading risking behaviors of motorcycle drivers.

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