

REPORT OF RESEARCH RESULTS

The components and indicators of road safety management on the motorcycle service delivery during Covid-19 pandemic

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Summary

Since March 2020, the WHO had declared COVID-19 a world-wide pandemic. People might also be more inclined to get home delivery of goods purchased online then the motorcycle is becoming a prominent role in delivery services. When COVID-19 pandemic, it causes the motorcycle riders get higher speed that led to more collisions and to greater injury severity as the delivery services have to deliver goods on time with packed orders in the same time. Also, they may lead to COVID-19 spreads out if they will not be wearing mask or social distancing strictly. However, there is hardly any study on travel behaviour issues related to motorcycles in the COVID-19 pandemic, particularly in Asian countries as Thailand. This research was mixed methods with phenomenology qualitative design and factor analysis. A group of 10 managers from service delivery companies in 9 provinces were selected based on snowball sampling technique in the qualitative research study as well as the samples in the quantitative research consisted of 493 motorcycle riders throughout Thailand via electronic questionnaire. The content validity test was at 0.98, and the reliability was at 0.94. The data were analyzed using content analysis, exploratory and confirmatory factor analysis.

The results highlighted in Phase I which was phenomenology qualitative study among delivery service manager opinions. The results showed that there were 8 components of the road safety management including (1) Road safety management in driver behavior, (2) Road safety management in driver physical and mental health, (3) Road safety management in driver skills and experience, (4) Vehicle safety management, (5) Roadside safety management, (6) Road safety requirements, (7) Compliance with driving laws and regulations, (8) Safety promotion of delivery service during the COVID-19 pandemic. Then, in Phase II of Quantitative research, there were 6 components of the road safety management from motorcycle riders of delivery service with 40 indicators with factor loadings as follows: Safety promotion of delivery service during the COVID-19 pandemic (.86), Vehicle safety management (.85), Compliance with driving laws and regulations (.81), Driver behavior (.64), Roadside safety management (.58), and Driver physical and mental health (.56). In conclusion, the results highlighted the new knowledge of road safety management among the motorcycle service delivery during Covid-19 pandemic in the 6 components with 40 indicators particularly the top 3 components for safety promotion during the COVID-19 pandemic as well as vehicle safety management and concerning the compliance with driving laws and regulations.

Aim of Research

This study aims to determine the components and indicators of road safety management on the motorcycle service delivery during Covid-19 pandemic that can give first indication of motorcycle service delivery riders who influence on safety on the roadway and in community.

Method of Research & Progression

Introduction

Since March 2020, the WHO had declared COVID-19 a world-wide pandemic with 216 countries, areas or territories showing 187,086,096 confirmed cases of COVID-19, including 4,042,921 deaths combined as of July 12, 2021 (World Health Organization, 2021). This pandemic led to a series of worldwide public health measures to contain and reduce its spread. As a result of social distancing, travel demand might drop due to an increased amount of working from home, e-learning, and a reduced number of public activities and events (de Vos, 2020d). People might also be more inclined to get home delivery of goods purchased online (e.g., food, clothes), resulting in fewer shopping trips (Shi et al., 2019).

The motorcycle is becoming a prominent mode in Asian countries that it is about four-fifth of motorcycles in the world (Nguyen, 2013). There is hardly any study on travel behaviour issues related to motorcycles in the pandemic, particularly in Asian countries. When COVID-19 pandemic, it causes the driver get higher speed of driving (Carter,2020). The speeding-related fatalities accounted for approximately 48 % of overall fatalities during this time period, 41 % higher than the 5-year average (Lockwood et al., 2020). Hence, preliminary data have shown jurisdictional variations in speed and in speeding-related fatalities, especially young males, be excessively speeding due to lower traffic congestion on roadways, more speeding lead to more collisions and to greater injury severity in resulting collisions. Vehicle velocity is one determinant of collision risk and injury severity including motorcycle (Kröyer et al., 2014; Richards, 2010).

Furthermore, motorcycle delivery services have to deliver goods or foods to customer on time, the motorcycle riders sometimes use high speed. Delivery riders are typically paid on every order assigned; therefore, their earnings depend 24 heavily on the number of orders delivered and riding distance within the work hours (Paulssen, 2014). Under most circumstances, deliverers have to cope with several orders of different customers at the same time. Because of the time constraint for each order and potential penalties for delayed delivery, it was critical for them to plan an optimum delivery route and minimize the time spent on riding during work. These conditions all translate into an increase in their road accidents. (Zheng, et.al., 2014) Also, during the COVID-19 pandemic the motorcycle not only concerning about delivery goods on time, they may lead to COVID-19 spreads out if they will not be wearing mask or social distancing strictly. Therefore, this research study aims to identify the components and indicators of road safety management on the motorcycle service delivery during COVID-19 pandemic that can give first indication of motorcycle service delivery riders who influence on safety on the roadway and in community.

Methodology

This research was mixed methods with 2 phases of phenomenology qualitative design and factor analysis. A group of 10 managers from service delivery companies in 9 provinces as urban cities with the dark-red zone of COVID-19 pandemic from 5 regions of Thailand were selected based on snowball sampling technique in the qualitative research study, using in-depth interview with semi-structural questions as well as the samples in the quantitative research consisted of 493 motorcycle riders throughout Thailand via electronic questionnaire with 55 items. The content validity test was at 0.98, and the reliability was at 0.94. The data were analyzed using content analysis for qualitative research, exploratory and confirmatory factor analysis for quantitative research.

Results of Research

Demographics and health behaviours of participants

Four hundred and ninety-three motorcycle riders in the service delivery throughout Thailand responded in this study. The majority of respondents were male (86.80%), middle aged in a range of 17-30 year (52.90%) with an average age of 31-year-old. Half of respondents had earned a high school/vocational certificate (47.90%). The majority of the respondents have work in food delivery companies such as LINEMAN (44.44%), Grab Driver (28.60%), and Food panda (23.30%). Most of them work in Bangkok and Central region (77.50%) as a delivery rider in average 3.43 years with a range of 5-8 hours a day (62.90%). For the health behaviours, about 92.1 percent of motorcycle riders received at least 3 doses of COVID-19 vaccination, about 78.9% wearing a mask to cover nose and mouth when going out all the time, and more than half of them keeping frequency of hand washing with alcohol per day (56.00%), social distancing (53.80%), washing hands with alcohol before and after delivering food/products to customers (53.10%), and avoid being in crowded places (57.20%).

Phase I: Qualitative study on road safety management

Phase I through qualitative methods and integrative review for content and domain specification, items were improved until saturation was achieved. The preliminary instrument consisted of 8 components of road safety management from delivery service manager opinions with content as follows: (1) Road safety management in driver behaviours, (2) Road safety management in driver physical and mental health, (3) Road safety management in driver skills and experience, (4) Vehicle safety management, (5) Roadside safety management, (6) Road safety requirements, (7) Compliance with driving laws and regulations, (8) Safety promotion of delivery service during the COVID-19 pandemic.

Phase II: Quantitative study on components and indicators of road safety management

The results of the confirmatory factor analysis of the measurement model of the components of road safety management from motorcycle riders of delivery service with statistical factor analysis (EFA and CFA), after adjusting the relations between the measurement errors of the model, revealed that the model was very consistent with the empirical data. The quotient between the chi-square with the degrees of freedom equivalent to 0.95 by χ^2 was equivalent to 14.18 and the degrees of freedom was equivalent to 8 with the level of statistical significance over 0.05 (p-value = 0.77). The Goodness of Fit Index (GFI) was equivalent to 0.98, and the Adjusted Goodness of Fit Index (AGFI) was equal to 0.94. The Root Mean Square Error of Approximation (RMSEA) was 0.05. Therefore, from the confirmatory factor analysis of the measurement of the road safety management it could be concluded that this model was consistent with the empirical data.

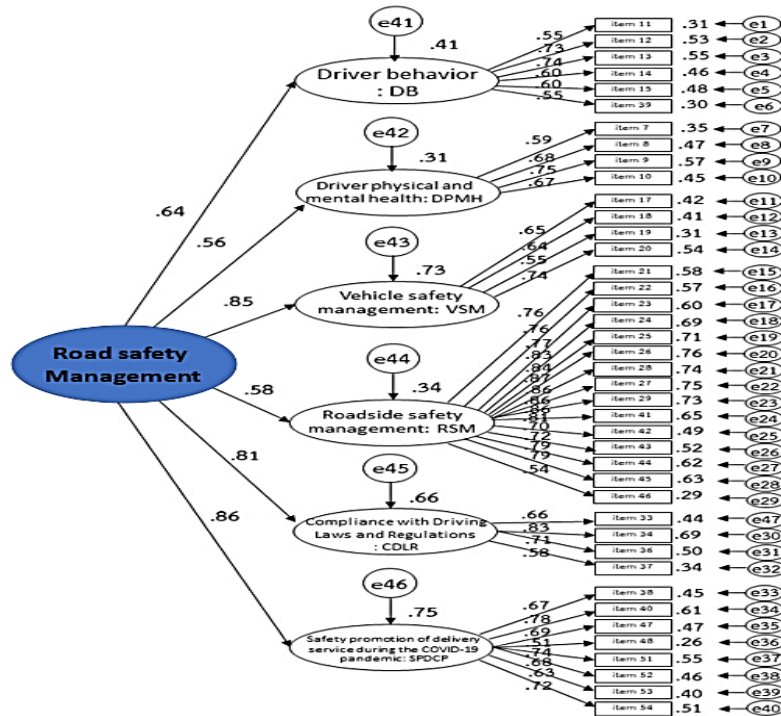


Figure 1: A model of road safety management measured by the weight of standard components

When considering the 6 components, it was found that the weights of the components of each model of the 40 indicators was statistically significant at 0.05 with the standard component weight (factor loading) of the 40 variables ranging from 0.56 to 0.86 as follows: (1) safety promotion of delivery service during the COVID-19 pandemic (.86) with 8 indicators, (2) vehicle safety management (.85) with 4 indicators, (3) compliance with driving laws and regulations (.81) with 4 indicators, (4) driver behaviors (.64) with 6 indicators, (5) roadside safety management (.58) with 14 indicators, and (6) driver physical and mental health (.56) with 4 indicators. (Figure 1)

Table 1: The road safety management of the motorcycle service delivery each region of Thailand

Regions		DB	DPMH	VSM	RSM	CDLR	SPDCP
Bangkok	Mean	4.63	4.62	4.62	4.58	4.60	4.62
	Std.Deviation	.39	.43	.43	.46	.45	.42
Central region	Mean	4.65	4.64	4.62	4.60	4.65	4.65
	Std.Deviation	.40	.45	.44	.43	.39	.37
Northern region	Mean	4.72	4.80	4.54	3.44	4.66	4.42
	Std.Deviation	.32	.31	.40	.47	.44	.43
Southern region	Mean	4.58	4.65	4.41	3.43	4.40	4.31
	Std.Deviation	.33	.34	.37	.46	.42	.42
Eastern region	Mean	4.63	4.70	4.46	3.59	4.46	4.26
	Std.Deviation	.34	.30	.37	.59	.36	.32
Northeastern region	Mean	4.68	4.86	4.54	3.56	4.50	4.37
	Std.Deviation	.38	.23	.38	.59	.47	.46
Total	Mean (Full score 5.00)	4.64	4.66	4.59	4.34	4.60	4.57
	Std.Deviation	.38	.41	.43	.65	.43	.42

Table 1 showed that scores of the road safety management of the motorcycle service delivery each region of Thailand. Bangkok was the lowest score of driver physical and mental health (4.62), the Northern region was the lowest score of roadside safety management (3.44), the Eastern region was the lowest score of safety promotion of delivery service during the COVID-19 pandemic (4.26), the Northeastern region was the lowest score of compliance with driving laws and regulations (4.50); whereas, the Southern region had three lowest scores in the components of driver behaviors (4.58), vehicle safety management (4.41), and roadside safety management (3.43).

Implications for road safety management practice and policy makers

As the top component by factor loading was the component of safety promotion during the COVID-19 pandemic so we give suggestion according to 8 indicators such as (1) traffic police strictly and continuously enforce traffic laws on driving licenses, stopping, parking, speeding, measure alcohol; (2) training on traffic, road safety and the impact of road accidents during the COVID-19 outbreak; (3) the preventive measures for COVID-19 prevention appropriately and easily; (4) appropriate regulations on the standards required in technical vehicle inspections; (5) delivery organizations have training on infection prevention and spread during the COVID-19 pandemic; (6) speed limits in urban areas; (7) motorcycle drivers have flexibility in using delivery application technology and services during the COVID-19 pandemic; and (8) appropriate signalling when having an accident on the road.

Future Areas to Take Note of, and Going Forward

The government and delivery service companies can use the 6 components and 40 indicators for building a guideline or measurements of road safety management. They may also focus on the development of road safety management on the motorcycle service delivery in each region of Thailand diversity according to the problem in each component. Moreover, the service delivery companies should do the road safety promotion by coaching and training for managers and motorcyclists on traffic, road safety and the impact of road accidents, and infection prevention during and post the COVID-19 pandemic. Both government and private sectors should provide the potential interventions or IT application of driver behaviour program and physical and health checking for motorcycle service delivery riders.

Means of Official Announcement of Research Results

After complete the data analysis, the preliminary report will be distributed to stakeholders. They will be invited to gathering the research findings as part of input in the context of planning and preparing social protection mechanisms. The research results will be presented in the international journal. It could be one of the following journals; Asia-Pacific Journal of Public Health, Journal of Safety Research, Safety and Health at Work. The publication should be disseminated within 3 years after project complete.

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