

# KNOWLEDGE, ATTITUDE, AND PRACTICE TOWARDS HELMET USE AMONG MOTORCYCLE RIDERS AND PASSENGERS IN RATCHABURI PROVINCE, THAILAND

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**ABSTRACT:** A cross-sectional study aimed to describe and to find factors associated with helmet use among motorcycle riders and passengers in Ratchaburi Province, Thailand. The study involved 430 people 18-59 years of age, motorcycle riders or passengers living in Ratchaburi Province for at least 6 months who twice a week used their helmets, most of them motorcycle riders. Accidental sampling was conducted at the study sites, by structured questionnaire, a large motorcycle use area, market car park or super market car park from the three markets in Mueang Ratchaburi: Robinson Store, Big C Supermarket, and Sree-Mueang Market. Descriptive statistics, Chi-square test, and Pearson's Correlation were used to find an association between socio-demographic data, knowledge, and attitude in regards to helmet use practice. The study found that most of the respondents between age 40-59 (24.2%) were female (50.5%), 25.8% had finished secondary school, 53.5% were general wage earners, 68.1% had a personal average monthly income less than 10,000 baht. Most of respondents 87.2% had a household income of 10,000-50,000 baht. About 66.5% of the samples used their helmet and the majority of the samples were motorcycle riders, 87.2% had experience in motorcycling for 1-20 years and 72.1% used the motorcycle on a daily base. Eighty-one point nine percent of the respondents used their own helmets with 40.1% of them using half-face helmet type. Seventy-six point four percent of the respondents used the helmet certified by Thai Industrial Standards Institute and 47.2% of them used their helmet for 3-5 years. The respondents did not experience any accidents during the past and those who faced one did not wear their helmet (94.7% and 60.9% respectively). The level of knowledge was moderate but the attitude toward helmet use was positive. The level of practice was divided into good and excellent levels. The result revealed that scores of knowledge and attitude were associated with the practice (*p-value* <0.05). Therefore, knowledge and attitude have an effect on practice. As public health significance, it can be used in planning and in problem solving regarding ignorance of or awareness on helmet use in motorcycling.

**Keywords:** Motorcycle, Knowledge, Attitude, Practice, Helmet use, Ratchaburi Province, Thailand

## INTRODUCTION

According to the World Health Organization (WHO) the mortality rates from accidents of road traffic worldwide is more than 1.3 million people. It was further estimated that 20 to 50 million people were injured and more in severe situation. The accident rate also tends to increase annually. Low or middle-income countries experienced higher accident rates than those in high-income countries. Reported accident rates were around 21.5 and 19.5 per 100,000 population of low and middle-income countries and combined with high-income countries the accident rate was around 10.3 per 100,000 population respectively. Half of the accidents and

deaths are caused by motorcycle use. The top ten ranking causes of death in population included road traffic injuries. In 2004, road traffic injury was ranked ninth (2.2%) and WHO [1] has predicted that death rank in 2030 will be the fifth (3.6%).

Traffic accidents are common in Thailand. Accidents are not only the causes of death but also affect economic impacts and damages/losses. The cost of property damage caused by road accidents was estimated at 779.4 million baht. Moreover, an impact from road traffic accident on disability and disability adjusted to life years loss (DALYs) in 2004 was highest in the age bracket of 15 to 29 years old [2]. Motorcyclists can yield deaths with an increasing trend during 1988 to 2009 from 50.7% up to 62.0%. Helmet use has been one of the

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helping factors to reduce the probability of fatality and severity from road traffic accidents. The accident rate in Thailand has always been particularly high during long holidays. When people consume alcohol while driving, accidents are more severe. The records of the Police Information System Center by the Royal Thai Police indicated that the numbers of road accidents, deaths, and injuries have always been steadily high during long holidays. From the Asian Development Bank (ADB)'s research, it was indicated, upon a comparison of the accident rate among 10 Asian countries, that Thailand was ranked second regarding fatal accidents in 2003 [3].

Nowadays, motorcycle use has been majorly increased, especially among developing countries. Therefore, the accident rate of motorcycle use has since long been one of the public health's strong issues. The severity of the problem is head or spinal injuries. A motorcycle helmet is regarded as a means to protect head and spinal injuries of both riders and passengers. Unfortunately, to wear helmet is not a strict behavior. In China, for instance, there were only 34% of riders and 71% of passengers who wore helmet. It affects the perspectives of physical, mental, and social situation of the person and other factors, such as family [4]. Since the motorcycle helmet is important, there has been law enforcement and enactment imposed to reduce the problems caused by non-wearing [5].

Ratchaburi Province is located in western Thailand. Ratchaburi Tertiary Hospital, from 2001 to 2003, reported an increasing trend of accident cases among motorcyclists (from 2,769 cases up to 3,155 cases). Most of the people involved did not wear helmets [6]. In 2009, there were 42,137 accidents [3]. In 2010, the number of motorcycles was the largest transport vehicles (281,597 motorcycles) compared with other provinces in western Thailand [7]. Thus, stakeholders must recognize the issue and try to find solutions. In addition, causes of accident were both direct and indirect. Most direct causes are related to speed and improper passing, among motorcycle user especially, while indirect causes are related to drunkenness and sleepiness. Moreover, crash causes from overloading trucks and defective vehicles are counted as other accident causes, yet short of literatures [3].

The current study sought to know about the level of knowledge, negative or positive thinking about helmet use and the actual practice. It is presumed that this approach will lead to an increase in helmet wearing and thus reduce the negative thinking towards helmet use among motorcycle riders and

passengers [8]. The aim was to study and to find factors associated between the knowledge, attitude, and helmet use among motorcycle riders and passengers in Ratchaburi Province.

## MATERIALS AND METHODS

The research respondents were between 18-59 years old, motorcycle riders or passengers, living in Ratchaburi Province for at least 6 months, using a motorcycle at least twice a week. Total respondents were finalized at 430. Accidental sampling technique was used and data collection was conducted at the three study sites, a large motorcycle use area: Parking lot at Robinson Store, Big C Supermarket, and Sree-Mueang fresh market in Mueang Ratchaburi. Data collection was done by the use of structured questionnaire incorporating information on sociodemographic data & status of motorcycle and helmet use (15 items of statements), knowledge guideline on helmet use while riding a motorcycle or being a passenger (15 items), attitude (19 items) as well as practice (10 items). Data was collected in February 2012. The statistics in use were descriptive statistics and the Chi-square test and correlation to find an association between independent and dependent variables. Ethics approval was obtained by COA no. 03212555 by Chulalongkorn University.

## RESULTS

Based on collected data, most of respondents aged 40 to 59 (24.2%), female (50.5%), finished high school (25.8%), whose occupation was employee (53.5%). For monthly personal income, 68.1% had less than 10,000 baht, 87.2% had 10,000 to 50,000 baht as monthly family income. They were mostly riders (66.5%), passengers (33.5%). The experience of motorcycle use was divided into 2 groups: 1 to 20 years (89.1%) and 21 to 40 years (10.9%). Majority of the respondents used motorcycle on a daily basis (72.1%), owned helmet (81.9%), and used half-head type of helmet (40.1%) which is certified by the Thai Industry Standards Institute (76.4%). The lifespan of their helmets was 3 to 5 years (47.2%). In addition, 23 respondents (accounted for 5.3%) faced an accident in the past, thereof not using helmet (60.9%).

For the scores of knowledge, attitude, and practice, the minimum and maximum of knowledge scores were 4, 14 respectively for a total of 15. Minimum and maximum scores of samples' attitude were 27 and 55 respectively including mean and median/mode around 44 and 46. For practice scores, most of them got 24 and mean score was 21.01 (minimum scores 12, maximum scores 30).

**Table 1** Knowledge, attitude, and practice levels

Groups	Score	N	%	Mean	Median	Mode	S.D.	Min	Max
<b>Knowledge</b>									
Poor	0-8	21	4.9	7.24	8.0	8	1.091	4	8
Moderate	9-12	216	50.2	11.33	12.0	12	0.867	9	12
High	13-15	193	44.9	13.48	13.0	13	0.501	13	14
<b>Attitude</b>									
Negative	1-19	0	0.0	0.0	0.0	0	0.0	0	0
Neutral	20-38	39	9.1	33.82	35.00	37	3.060	27	38
Positive	39-57	391	90.9	46.07	46.0	46	3.073	39	55
<b>Practice</b>									
Fair	0-10	0	0.0	0.0	0.0	0	0.0	0	0
Good	11-20	162	37.7	17.16	18.0	18	2.218	12	20
Very good	21-30	268	62.3	23.33	23.0	24	2.086	21	30

The average score of 3 parts knowledge, attitude, and practice was 12, 45, and 21, respectively. Furthermore, the level of knowledge, attitude, and practice was divided into 3 groups (knowledge for yes, do not know for no; attitude in positive-neutral-negative; and practice for fair-good-very good). The result revealed that knowledge was of moderate level (50.2%) from 9-12 points with 11 as average scores. Almost all respondents possessed a positive attitude (90.9%). Scores of positive attitude were 39 to 57 (minimum 37, maximum 59). The average score of the positive group was 46. Practice, same as attitude, indicated that the majority of respondents got very good level (62.3%) at 21 to 30 points. The minimum and maximum score of this group was 21 and 30, respectively. Each level is shown in Table 1.

The relationship between independent variables (sociodemographic data, motorcycle and helmet use status, knowledge, attitude and dependent variable (or practice of helmet use) was tested by chi-square test. Practice of helmet use was associated statistically significant with ages, gender, occupation, and personal monthly income (sociodemographic data) ( $p$ -value <0.05). There were 38 respondents age less than 20 years who got very good level of practice, 24 respondents (9.0%), and good level for 14 respondents (8.6%). Most of 20 to 40 year- group had a very good level (175 respondents or 65.3%). People aged over 40 years or 94 respondents had a very good level of practice (69 respondents, 25.7%). The result of relation between age group and level of practice was 6.570 of  $\chi^2$ . A high number of males had a very good level (116 respondents, 43%) while females were equal (152 respondents, 56.7%). The  $\chi^2$  value of gender was 11.121. Most of occupation was agriculture or employee. Others were salesmen and private business owners with small difference between good and very good level (116 respondents,

71.6%) and 207 respondents (77.2%) respectively. Fifty-seven respondents (21.3%) among students and government officers had a very good level of practice (94 respondents, 21.9%). The last occupation group was composed by motorcycle taxi with good more than very good level of practice, 9 respondents (5.6%), and good level from 13 respondents (3.0%). The  $\chi^2$  value of occupation was 6.054. Most people had a monthly income of less than 10,000 baht and got a very good level of practice (195 respondents, 79.9%) out of 293 respondents (74.9%).

For motorcycle and helmet use status, the associated factors were rider status, years of experience with weekly motorcycle use, ownership of helmet, helmet certification, and experienced accident for the past year ( $p$ -value <0.05). Rider status was divided into rider and passenger. Of 286 respondents of total riders, very good level of practice had 167 respondents, (62.3%) and for passengers it was similar to most of very good level of practice (101 respondents, 37.7%) from 144 respondents (33.5%), with  $p$ -value <0.05 ( $p$ -value = 0.018) at 5.629 of  $\chi^2$  value. Most participants have been using their motorcycles for 1 to 20 years more in the 21 to 40 years group, or 383 respondents (89.1%). This group got very good level of helmet use practice, or 229 respondents (85.4%) at 9.586 of  $\chi^2$  value. About 351 respondents (81.6%) had their own helmet and for most the level of practice was very good, or 208 respondents (77.6%). Those who did not own their helmet were 79 respondents (18.4%), divided into 60 respondents (22.4%) of very good level at 7.650 of  $\chi^2$  value. 173 respondents (82.8%) were the owner of Thai Industry Standards helmet's certification, out of 269 respondents (76.4%),  $\chi^2$  value was 16.819. For experienced accident and helmet use in accident, the result revealed that the experience with accident of motorcycle use during the past year was

**Table 2** Relationship between knowledge, attitude, and practice of helmet use

Levels	Practice level of helmet use			$\chi^2$	<i>p-value</i>
	Good	Very good	Total		
<b>Knowledge</b>					
Poor	17 (81.0%)	4 (9.0%)	21 (100.0%)	31.640	<0.001
Moderate	133 (61.6%)	83 (38.4%)	216 (100.0%)		
High	72 (37.3%)	121 (62.7%)	193 (100.0%)		
Total	222 (51.6%)	208 (48.4%)	430 (100.0%)		
<b>Attitude</b>					
Neutral	140 (72.9%)	52 (27.1%)	192 (100.0%)	62.953	<0.001
Positive	82 (34.5%)	156 (65.5%)	238 (100.0%)		
Total	222 (51.6%)	208 (48.4%)	430 (100.0%)		

**Table 3** Correlation between knowledge and attitude scores with practice scores

Score Group	Practice Scores	
	Pearson's Correlation	<i>p-value</i>
Knowledge Scores	0.197	<0.001
Attitude Scores	0.403	<0.001

significantly associated with the level of practice of helmet use at *p-value* <0.05 (*p-value* = 0.005). The  $\chi^2$  value was 7.851 and most people never experienced any accident during the past year (407 respondents, 94.7%) and level of very good practice was found in 260 respondents (97.0%).

On the other hand, the association between knowledge and practice compared with correct reply and not correct reply was statistically significant (*p-value* <0.05) on some items, e.g. increasing safety, law and regulations, leading causes of death and disability, cost and time spent on treatment when accident occurs, improper helmet use upon an accident, and not wearing helmet due to belief in one's careful ride. The attitude was statistically significant with practice at *p-value* <0.05. Furthermore, the level of knowledge and helmet use was significant at *p-value* <0.05 (*p-value*<0.001) with moderate practice and good practice. Moreover, high level of knowledge showed very good practice, more than only good practice (Table 2).

The level of attitude compared to score criteria showed levels of neutral and positive attitude. The relationship between attitude group and their practice group of helmet use was significant at *p-value* <0.05 (*p-value* <0.001) and the  $\chi^2$  value was 62.953. This result suggested that the positive attitude was associated with very good level of practice (156 respondents, 65.5%) from total of positive group (238 respondents, 100.0%).

Data from Table 3, by the use of Pearson's correlation coefficient, a test on the relationship between knowledge and attitude scores with practice scores, revealed positive direction of

significant correlation at *p-value* < 0.05.

## DISCUSSION

Most age group represented in the current study was the group 40 - 59 years old (24.2%). Most of them got a very good level which was significantly associated with helmet use practice. This was in line with Prapasanobola [9] whose study found that 325 respondents, mostly aged 20 to 25 years, (92.5%) and Li et al. [4], study which found improper helmet use as age related. According to Read [10], gender was involved in different health status or behavior by finding that women were more aware of health care practice than men. Majority gender in this study was female (50.5%). This finding was in contrast to Prapasanobola [9] that whose study found that gender was not related to helmet use practice. Personal monthly income was associated with helmet use practice, however, the high income group might not possess high practice. This was in line with Parkin et al. [11] who found that family-income was in different proportion of increasing helmet use. As the current study was conducted in both riders and passengers, it was therefore different from other studies. The motorcycle use status was associated with practice. This was in line with Prapasanobola [9] there was an association between experience of motorcycle use and practice which corresponded to the current study. Moreover, their findings showed owner helmet status was also significantly associated with practice which was the same as the current study's finding. Finally, the experience of accident was significantly associated with practice. This was in contrast to Prapasanobola [9].

The rationale of this current study was an increase in deaths and disability caused by motorcycle accidents. There are many factors associated with. Knowledge and attitude were the key factors in this study showing whether better understanding and thinking on helmet use would affect action or practice. This was in line with Kaliyaperumal [12] who suggested that people's understanding of an issue appeared in a great majority as problem solutions, including how to think and to put into action.

When compared knowledge scores and helmet use practice scores, there was a correlation at  $p$ -value < 0.05. The majority of the respondents knew about correct reply of severity from head injury accident, increasing safety from helmet use, and law relating to helmet use. The same was found as associated factors in the study by Prapasanobola [9]. However, this was in contrast to the study by Li et al. [4] where knowledge did not associate with practice.

For attitude and practice, there was an association between the two. Most of respondents got positive level of attitude. This was in line with Tadteang [13] whose study found that attitude was associated with helmet use practice and the study by Li et al. [4] whose result supported the benefit of helmet use practice (58.9%). The authors referred to the importance of helmet wearing (68.3%) based on level of positive attitude. Another study was conducted by Hung et al. [8] in Vietnam where respondents supported the negative attitude that helmet use could not help reducing injury (>95%), that it was uncomfortable to wear and difficult to store while parking. On the other hand, Ross et al. [14] study on the Planned Behavior Theory and helmet use was a measurement of attitude towards helmet law and helmet use practice. The result supported the importance of helmet use as more important than comfortable/uncomfortable attitude. Regarding uncomfortable use of helmet in the current study, the heavy weight of helmet seemed to be a problem, including a damage to hair style or the believe that helmet did not reduce severity of head injury. In line with Tadteang [13], there was an agreement on uncomfortable helmet use (44.2%) and disagreement (33.9%). Agreement on a damage to hair style was 45.2% and that helmet did not reduce severity of head injury (61.5%). The current study got 18.8% on uncomfortable use of helmet, 26.3% of a damage to hair style, and helmet use not reducing severity of head injury (36.7%). A note of caution, though the level of attitude was good, it might not sustain in practice

as the high level of knowledge and attitude might occur from strict surveillance by policemen especially in urban areas. The recommendation made was mainly about policy and law related to helmet use in Rachaburi province for safety, healthy life, and prevention.

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