

Safety Riding Gear Wearing Status among Industrial Workers Commute to Work in Bangi: A Baseline Study

N. K. Alias*, A. Azhar, W. Ameer Batcha and Z. H. Zulkipli

Vehicle Safety and Biomechanics Research Centre, Malaysian Institute of Road Safety Research (MIROS), 43000 Kajang, Selangor, Malaysia

*Corresponding author: noorkamaliah@miros.gov.my

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Abstract – In Malaysia, motorcyclists have been known to record the highest fatality rate in road accidents every year. On average, around 12 motorcyclists and pillion riders die each day in road accidents. This is a cross-sectional study conducted among workers riding to work and return from work in selected manufacturing companies in Bangi. Results show the wearing rate of safety helmet and vest among selected companies that participated shows high compliance of helmet wearing while the wearing rate of safety vest was very low, less than 4%. Most of the riders wore the jacket during riding (70.5%) however it was dark colour (74%) and not a proper riding jacket. Last but not least, about 71% of rider wore proper footwear to their workplace rather than slipper. Full commitment from employer and employee is a must to create a safety culture among riders.

Keywords: Safety helmet, safety vest, conspicuity, commuting safety

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1.0 INTRODUCTION

As known, in Malaysia, motorcyclists have been recorded the highest fatality rate in road accidents every year. On average, around 12 riders and pillion died every day in road accidents. Comparatively, for other road users (i.e., non-motorcyclists), seven people died each day. According to the Statistical Report on Road Accident by Malaysia Royal Police (2019), the number of road accidents involving motorcycles in 2018 was 113,288 which resulted in the death of at least 4,128 motorcyclists and pillion riders as shown in Table 1.

Table 1: Fatalities by road user category for 2014 to 2018

Category	2014	2015	2016	2017	2018
Car	1,258	1,358	1,489	1,269	1,167
Motorcycle	4,179	4,203	4,485	4,348	4,128
Pedestrian	515	482	511	441	407

Safety riding gear in this research refers to Personal Protective Equipment (PPE) for riding such as jackets, vests, boots, and helmets that motorcyclists wear when riding. Safety riding gear is an important item for the motorcyclist in order to protect themselves when a crash happens as many studies indicate that the head, legs, and arms of a rider are most likely to be injured in a collision. Most injuries among motorcycle riders involving fatalities are on the head. This is supported by a study from Kulanthayan et al. (2000) that revealed the death of almost half of the motorcyclists in Malaysia (49.2 %) is due to head injuries.

In Malaysia, the implementation of helmet law had been done since 1973 because of safety concern regarding fatalities among motorcyclist and series of the initiative had been carried out since then to increase helmet wearing rate among motorcyclist. Motorcyclist's attire is one of the factors contributing to motorcyclist's conspicuity to another road user. Wearing bright attire and adding a reflector to the helmet are examples of cheap solutions that could reduce the risk of motorcyclists on road (Solah et al., 2013). A study conducted in New Zealand showed that the risk was 24% lower for a motorcyclist getting into an accident if the rider was wearing a white helmet, instead of a black helmet and the risk was 37% lower if the rider wearing any reflective or fluorescent clothing (Wells, 2004).

Various mitigation measures have been implemented by the Government of Malaysian to reduce the motorcycle accident rate. For instance, the use of daytime running lights (DRLs) to improve the front conspicuity of vehicles in the daytime. They are intended to increase the chance of other road users seeing the approach of the vehicle. A previous study by Radin Umar et al. (1996) revealed a 22% reduction of motorcycle conspicuity related accident thru DRL implementation on motorcycles. The government has built a motorcycle pathway in several high-risk accident areas, launched road safety campaigns for motorcyclist, but all these measures seem ineffective in reducing the number of road accidents involving motorcycles.

As stated in 'SIRIM 4: Good Practices in Implementing Commuting Safety Management', the employee should educate the importance of proper fastening of safety helmet and usage of protective clothing such as safety vest and glove along their journey commute to and from work in order to reduce risk of getting involved in a road accident and risk of injury and fatality (SIRIM, 2014). Thus, this study is keen to observe the wearing rate of safety helmets and safety vests among workers of selected companies in Bangi.

2.0 METHODOLOGY

2.1 Study Population

This is a cross-sectional study conducted among workers riding to and return from work in selected manufacturing companies in Bangi.

2.2 Sample Size and Sampling Methods

The sample size was calculated based on a single proportion formula with 95% C.I, 0.05 precision, and 88% prevalence of helmet wearing. After an increase of 20% to drop out, a total of 200 samples are required. This study used stratified sampling. In Bangi, there are about 10 companies and this study aims to get respondents from five companies. However, only two manufacturing companies did give permission.

2.3 Data Collection and Data Analysis Process

The observation took place nearby the company's parking lot as research personnel could observe the riders clearly. Proper use of a safety helmet was defined as a helmet that was worn with the strap correctly fastened and compliance was deemed to be present when the rider was wearing his helmet correctly. The observation will be done during the morning before working hours (7:30 – 9:30 am) and evening after working hours (4:30 – 6:30 pm) and limited to daylight hours to allow for a more accurate description of riders wearing the safety helmet and safety vest while commuting. In order to analyse the data, a frequency and cross-tabulation analysis had been carried out.

3.0 RESULTS AND DISCUSSION

A total of 263 motorcyclists were observed in this study and 98.1% of them were riding on a motorcycle to work and 94.2% return from work. Table 2 summarizes the helmet-wearing status by the time of observation. It can be seen clearly that the majority of the motorcyclist was wearing a helmet either on their way to work or from work. Overall, helmet-wearing rate supports previous findings such as a study from Abdul Manan et al. (2018) shown a high percentage of helmet wearing which is 98.9% among motorcyclist in Malaysia. However, it is also important to note that the percentage of the motorcyclist who did not wear a helmet during their journey to work is higher (5.8%) than during their return journey from work (1.9%).

Table 2: Helmet wearing status by time of observation

Categories	Description	Go to Work n (%)	Return from Work n (%)
Wearing status (N = 263)	Wearing	146 (94.2)	106 (98.1)
	Not wearing	9 (5.8)	2 (1.9)
Properness of wearing (N = 252)	Strap fastened	124 (84.9)	99 (93.4)
	Strap not fastened	22 (15.1)	7 (6.6)
Type of helmet (N = 252)	Full/open face	130 (89)	105 (99.1)
	Half shell	16 (11)	1 (0.9)
Colour (N = 252)	Bright	101 (69.2)	57 (53.8)
	Dark	45 (30.8)	49 (46.2)

Apart from helmet wearing status, observations had also been made to the properness of wearing, type and colour of the helmet. Out of the total motorcyclist who wore a helmet, the percentage of motorcyclist with unfastened helmets during their journey to work is higher (15.1%) compared to during their journey home after work (6.6%). The low percentage of improper wearing is similar to that reported in observational studies (Kulanthayan et al., 2000), which shows a low level of improper buckling with 21.4%. Most of the observed motorcyclists did wear a full/open face helmet and more than half did wear a helmet with a bright colour. Similarly, a survey in part of America found that only approximately 17 to 24 percent of riders reported wearing any of the following: a white or brightly-coloured helmet, a brightly coloured jacket, or a fluorescent/reflective safety vest (Higgins, 2012).

Referring to Table 3, the helmet-wearing status by the motorcycle's cylinder capacity is presented. Apparently, the wearing status for both types of motorcycle's cylinder capacities is high but it is also vital to highlight the percentage of helmet wearing among rider with

motorcycle less than 150cc. Out of the total observation, 4.5% of motorcyclists in this group did not wear a helmet. Most injuries among motorcycle riders are to the head, so helmets could significantly reduce the severity of head injuries. Studies have revealed that the death of almost half (49.2%) of motorcyclists in Malaysia is due to head injuries (Kulanthayan et al., 2000). Therefore, the proper use of safety helmets is one of the best ways to reduce the likelihood of death resulting from head injuries.

Table 3: Helmet wearing status by motorcycle's cylinder capacity

Categories	Description	< 150 CC n (%)	> 150 CC n (%)
Wearing status (N = 263)	Yes	234 (95.5)	18 (100.0)
	No	11 (4.5)	0 (0.0)

Turning now to the reflective safety vest-wearing status by the time of observation portrayed in Table 4, it can be seen that most of the motorcyclists were wearing jackets either on their way to work (71.6) or from work (63.9). Still, the percentage of the motorcyclist who did not wear any safety vest or jacket is moderately high for both time of observation with 25.8% found not to wear the attire during their journey to work and 33.3% were not wearing it during their journey back home.

Table 4: Safety vest- / jacket-wearing status by time of observation

Categories	Description	Go to Work n (%)	Return from Work n (%)
Wearing status (N = 263)	Safety vest	4 (2.6)	3 (2.8)
	Jacket	111 (71.6)	69 (63.9)
	Not wearing	40 (25.8)	36 (33.3)
Colour of attire (N = 187)	Fluorescent / high visibility	23 (20.0)	21 (29.2)
	Not fluorescent / low visibility	92 (80.0)	51 (70.8)

Colour of attire were also observed and the percentage of the motorcyclist who wore a safety vest or jacket with low visibility colour were stand out. From a study done by MIROS in 2016, 202 respondents (71.6%) out of 282 voluntary motorcyclists from Klang Valley have never donned a High Visibility Vest (HVV). However, this study shows a very low rate of wearing HVV with less than 3%. The result was expected as currently no laws enforcing the use of it in Malaysia but then in certain companies, they put the reflective material at the back of their uniform and it helps when riding in the dark.

The safety vest- / jacket-wearing status by the motorcycle's cylinder capacity is very low and presented in Table 5. Similar to the helmet wearing status, most of the motorcyclists were wearing proper attire but the percentage of motorcyclists below 150cc who did not wear any safety attire (29.8%) need to be taken into consideration. de Craen et al. (2011) indicates that the conspicuity of motorcycles can be improved with clothing. The research found that motorcycle rider's conspicuity is dependent on the degree of contrast with the environment; whereby motorcyclists can be easily seen when wearing reflective clothing at night. During the day, whether motorcycles and riders are easily detected depends on the environment. Wells et al. (2004) stresses that the risks involved in motorcycle collision correlated with what the rider was wearing. The risk of a motorcyclist getting into a traffic collision was 37% lower if the rider wore reflective or fluorescent clothing.

Table 5: Safety vest / jacket wearing status by motorcycle's cylinder capacity

Categories	Description	< 150 CC n (%)	> 150 CC n (%)
Wearing Status (N = 263)	Safety vest	5 (2.0)	2 (11.1)
	Jacket	167 (68.2)	13 (72.2)
	Not wearing	73 (29.8)	3 (16.7)

Motorcyclist's footwear is also observed and summarized in Table 6. Although the percentage of the motorcyclist who wore shoes is high for both time of observation, the percentage of slipper's wearer also has to be looked into. From the total observation, 36.1% wore slippers during their journey to work and 27.8% wore slippers during their return journey from work.

The footwear wearing status by motorcycle's cylinder capacity is presented in Table 7. Most of the motorcyclists were wearing proper footwear but the percentage of motorcyclists with less than 150cc who wore slippers (35.1%) is quite significant to be paid attention to.

Table 6: Footwear wearing status by time of observation

Categories	Footwear usage	Go to Work n (%)	Return from Work n (%)
Wearing Status (N = 263)	Shoes	99 (63.9)	78 (72.2)
	Slipper	56 (36.1)	30 (27.8)

Table 7: Footwear wearing status by motorcycle's cylinder capacity

Categories	Footwear usage	< 150 CC n (%)	> 150 CC n (%)
Wearing Status (N = 263)	Shoes	159 (64.9)	18 (100.0)
	Slipper	86 (35.1)	0 (0.0)

4.0 CONCLUSION

Observation done on the wearing rate of safety helmet and vest among selected companies shows high compliance of helmet wearing while the wearing rate of safety vest was very low, less than 4%. Most of the rider wore the jacket during riding (70.5%) however it was in a dark colour (74%) and not a proper riding jacket. Last but not least, about 71% of rider wore proper footwear to their workplace rather than a slipper. The employee is supposed to wear all the personal safety equipment such as helmet and safety vest during their ride to work as one of the good practices. It is recommended for employer to provide safety vests to their employees and implement the helmet and vest-wearing by Appointed personnel such as safety officer or security officer. One of the solutions is enforcing all the employees to wear a helmet and safety vest before entering the premises and out of the premises. Full commitment from employer and employee is a must to inculcate the safety culture among riders.

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