

A STUDY ON COMPLIANCE OF SAFETY BELT USAGE AMONG CAR DRIVERS IN DISTRICT OF BATU PAHAT, JOHOR

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ABSTRACT

Cars are the second (40%) most common mode of transportation in Malaysia. In terms of fatal road accidents, car drivers constitute about 9.0% and passengers 13.6% of fatalities. The major cause of car occupants' fatality in such accidents is head injuries, which consist of more than half (56.4%) of the fatalities. Thus restraining the head and body, the initial position is the most important injury control strategy for car users. The use of seat belts was deemed one of the most effective ways to reduce road accident fatalities in Malaysia and consequently the mandatory seat belt law was enforced in the early seventies. This paper presents the method of how to determine the level of practice of safety belt usage among car drivers in Batu Pahat and to identify the target group who are most likely to violate the safety belt law. A questionnaire study was carried out in Batu Pahat, Johor on the compliance behavior of car occupants in relation to seat belt use. A total of 218 respondents were interviewed and the data was analyzed using chi-square method. Three variables were found to be significant at percent level ($p < 0.05$): travel distance, location of travel and day of travelling. Compliance with the seat belt law was higher among drivers, educated car users, in the presence of enforcement activities, traveling in city-center areas and car users with a positive attitude towards the risks of speeding.

Key words: car accidents, injury, safety seat belt, statistical analysis

1. INTRODUCTION

The car is the second most common mode of transportation in Malaysia after the motorcycle. In 2003 alone, of the 12,819,248 registered vehicles with the Department of Transportation, close to half (5,428,774) were cars, representing 42% of the total vehicles registered in Malaysia. Of 5,849 fatalities registered in 2001, car drivers made up about 9.0% (527) of the deaths and 8.6% (4,335) of the casualties. Passenger fatalities for the same period stood at 797 (13.6%) and casualties at 4,712 (9.3%). Combined, the results indicate 1,324 fatalities (22.6%) and casualties of 9,047 (17.9%) for car occupants which stands next to driver and passengers in terms of number of fatalities and casualties. The major cause of car occupant fatalities in car accidents is head injuries, which account for more than half (56.4%). This usually occurs when car occupants are thrown out of the vehicle through the windshield or when they collide with the car seat or dashboard.

Experience from developed nations indicates that the use of seat belts is one of the most effective ways to reduce road accident fatalities (Evan, 1996). Studies have also shown that when a road accident occurs, the use of the seat belt prevents certain types of injuries to vehicle occupants or mitigates their severity (Shibata, *et al.* 1996). A safety seat belt which restrains the body in the original position to a seat has proved to reduce the risk of fatal

injury. The seat belt also helps the driver to control the car in a crash situation as it holds the passenger in place. Serious injuries occurring to passengers in motor vehicles are often caused by people being thrown into each other during a crash (Green, 1994). If a person does not wear his or her seat belt, that particular person could be thrown from his or her vehicle; through the windshield or door.

Similarly in Malaysia, the mandatory seat belt law was enforced in the early seventies following the passing of the seat belt law. Since then, the rate of seat belt use among private cars is believed to have increased, as no studies have been done to verify it. The closest study in this area in Malaysia was in 2003 among taxi drivers (Raha, *et.al.* 2004).

The results from a small sample (60) of taxi drivers in the city of Kuala Lumpur showed a seat belt compliance rate of 40%. Violation of the seat belt law is a compoundable offence with a maximum confine of RM300. The amount of fine imposed, however, depends on the discretion of the traffic police officer on duty and in most cases an amount of RM100 is imposed on each unbelted driver/front passenger who is detected violating the law. Often in rural areas, violators may be given an oral warning and advice from the traffic police. This may suggest a relatively low compliance level for seat belt law despite the generally acceptable compliance rate of seat belt use. Other factors affecting compliance behaviors such as comfort ability of the seat belt speed of travel, trip purpose and driving location warrant further investigation. Therefore, a study on the factors influencing the compliance behaviors of seat belt use among private cars is needed as to date no such research has been undertaken in Malaysia.

1.1 Problem statement

Based on road accident statistics in Malaysia (PDRM, 2003), the number of accidents increases every year. In 2003 alone, the percentage of motorcars involved in road accident was 35.9%. Cars involved in fatal road accident amounted to 27.3%. Also, cars are commonly involved in road accidents. Futhermore, Johor recorded the third highest accidents in Malaysia in 2003.

Thus this observation leads to the inevitable conclusion that the head and body are the most susceptible parts to injury and that restraining the head and the body in the initial position is important in any injury control strategy involving car users.

1.2 Objective

There are two objectives of this study:

- (i) To determine the compliance level of safety belt usage among drivers and passengers.
- (ii) To identify the target groups who are most likely to violate the safety seat belt law.

2. METHODOLOGY

The survey was carried out in the district of Batu Pahat, Johor over three months from December 2005 to February 2006 from 8am to 6pm. Batu Pahat was chosen as the study locality as it represents the highest incidence of road accidents in Johor. In addition, it meets the requirement of being a town surrounded by both urban and rural areas.

2.1 Sample

The samples of this study were car drivers and passenger cars using Batu Pahat roads. The sample size for this study was determined at 218 and 100% giving response. From this number, the sample was divided into a few categories of areas such as parking lots at

government offices, shopping complexes and residential areas. For the town areas, locations with sizeable car parking lots were chosen while for the outskirts and out of town areas (country side, residential areas and housing estates), the locations which were easily accessible to all kinds of drivers in the community such as sundry shops, community centre and food stalls were chosen for this study.

2.2 Instruments

To measure the compliance level of safety belt was using observation was made to prove that the respondents wear safety belt in location or not. The data of compliance was hiding from the respondent to achieve the proper data. The observation data was compared with the answer from the respondent to select the proper data. The data were collected through the use of a questionnaire, which consisted of three parts; background, knowledge and practice. Altogether, the questionnaire contained 42 questions to obtain information including driver and passenger's background, knowledge and practice. The questions were scored and categorized as 'yes' or 'no' for knowledge and 'never', 'rare', 'always' or 'most' for practices. For the purposes of the study, high knowledge and good practice were considered desirable attributes of car users with a higher compliance to seat belt use.

2.3 Statistical Analysis Method

The statistical package for the social sciences (SPSS) version 11.5 was used to analyse the data. Descriptive statistics were computed to examine level of compliance safety belt with characteristics of target group. A chi-square test was performed between satisfaction with compliance safety belt as the dependent variables and characteristic of target group as independent variables.

3. RESULT AND ANALYSIS

Examined were the relationships between compliance level and characteristics of target group offending scenarios. A total of 218 respondents were interviewed and the data analyzed using chi-square method. The result of chi-square method showed that certain personal characteristics were significant predictors of different aspects of compliance level of safety belt usage. The results are presented based on univariate and bivariate analysis

3.1 Univariate analysis

Univariate analysis was examined of the distribution of cases for a single variable at a time.

3.1.1 Compliance Practice Usage of Safety Belt

Figure 1 shows the percent of compliance among drivers and passengers. The analysis shows that, compliance was 62.8%, while non-compliance was 37.2%.

3.1.2 Age, Gender, Education Level, Location and Travel Distance

Figure 2 shows the percentage of driver and passenger age involved in compliance practice usage of safety helmet among driver and passenger. From the analysis, those above 21 years old were frequently involved in this activity with 79%, while those 20 years old and below was 21%.

Figure 3 shows the percentage of driver and passenger gender involved in compliance practice usage of safety helmet among drivers and passengers. Result shows more than half

(62.4%) male drivers and passengers involved in this activity compared to the female drivers and passengers (37.6 %).

Figure 4 shows the percentage of education level among driver and passenger which involved in compliance practice usage of safety helmet among driver and passenger. Result shows, low education respondents more than half (62.8%) involved in this activity compared to higher education respondents (37.2%).

Figure 5 shows the percentage of travel distance among driver and passenger involved in compliance practice usage of safety helmet among driver and passenger. Result shows, (81%) were traveling 10 km and below and (19%) were traveling above 11 km. Figure 6 shows the percentage of travel location among driver and passenger involved in compliance practice usage of safety helmet among driver and passenger. Result shows, urban respondents were more than half (76.6%) involved in this activity compared to rural (23.4%)

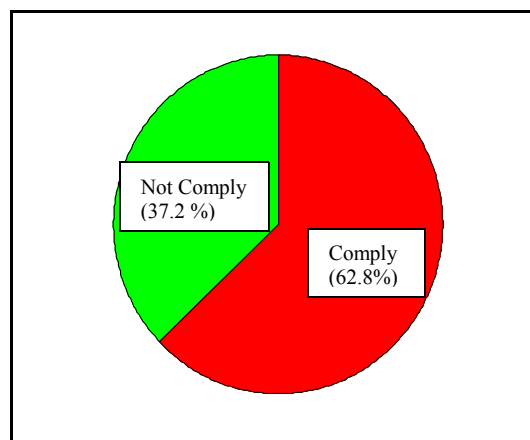


Fig. 1. Pie chart of percentage compliance of safety belt usage

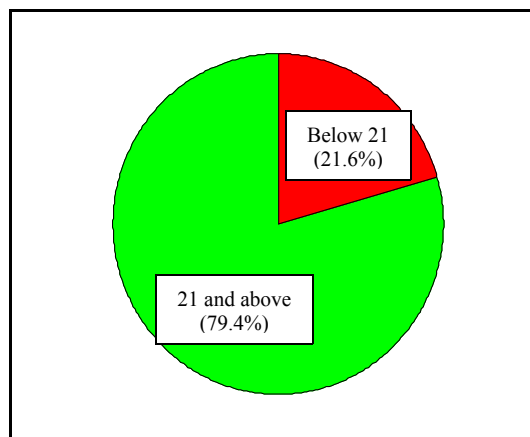


Fig. 2. Pie chart of percentage driver and passenger age

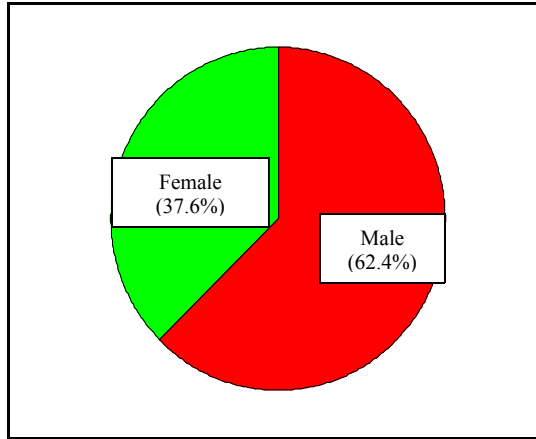


Fig. 3. Pie chart of percentage driver and passenger gender

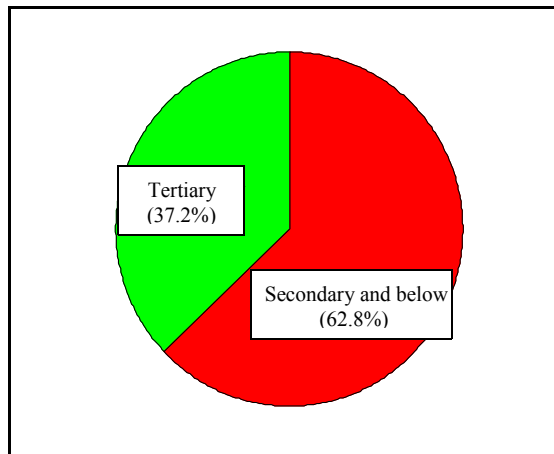


Fig. 4. Pie chart of education level of driver and passenger

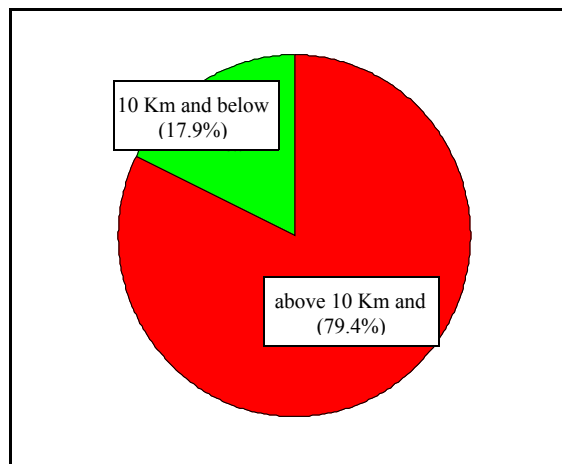


Fig. 5. Pie chart of percentage travel distance of driver and passenger

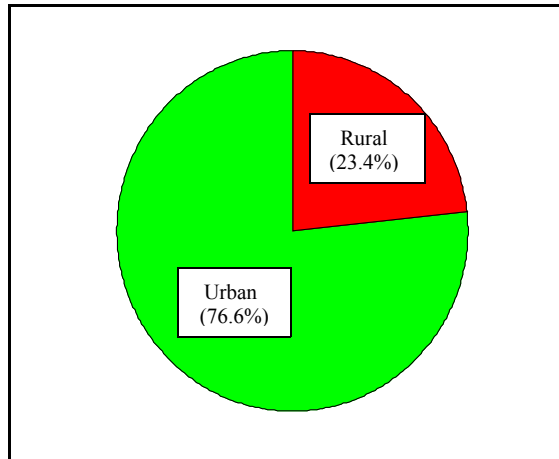


Fig. 6. Pie chart of percentage location of study

3.2 Bivariate Analysis

Bivariate analysis involves two variables the element of comparison is added together with the description of the subgroups.

3.2.1 Compliance of safety belt on travel distance

Table 1 shows the compliance to safety belt usage among car users for travel distance. The chi-square test shows significant ($p < 0.05$) in safety seat belt usage with respect to travel distance. Those car users traveling above 10 km are more likely comply with safety belt usage (76.9%) compared with car users traveling at 10 km and below.

Table 1. Compliance of safety belt by travel distance ($n=218$)

| Travel Distance | Comply | (%) | Not Comply | (%) |
|-----------------|--------|------|------------|------|
| 10 km and below | 107 | 59.8 | 72 | 40.2 |
| above 10 km | 30 | 76.9 | 9 | 23.1 |
| Total | 137 | 62.8 | 81 | 37.2 |

$\chi^2 = 4.032$ ($p < 0.045$)

3.2.2 Compliance of safety belt on location

Table 2 shows the compliance to safety seat belt usage among car users for location. The compliance practice usage of safety helmet is higher (71.3%) for town area respondents compared with outside-town respondents (64.7%). This shows that the outside-town respondents were not likely to comply with safety belt usage compared to urban respondents ($p < 0.05$).

Table 2 Compliance of safety belt by location

| Location | Comply | (%) | Not Comply | (%) |
|----------|--------|-----|------------|-----|
|----------|--------|-----|------------|-----|

| | | | | |
|--------------|------------|-------------|-----------|-------------|
| Outside town | 18 | 35.3 | 33 | 64.7 |
| Town centre | 119 | 71.3 | 48 | 28.7 |
| Total | 137 | 62.8 | 81 | 37.2 |

$\chi^2 = 21.640$ (p<0.00)

3.2.3 Compliance of safety belt on violation of law

Table 3 shows the compliance to safety seat belt usage among car users for violation of law. The results show that car users who have been caught by police for not using safety belt are more likely to comply (p<0.012) compared with those who have not been caught. The compliance level will be low among car users who view using a seat belt as fulfilling a traffic law rather than for their own safety benefits.

Table 3. Compliance of safety belt by violation of law

| Violation of law | Comply | (%) | Not Comply | (%) |
|-------------------------|---------------|-------------|-------------------|-------------|
| yes | 112 | 67.5 | 54 | 32.5 |
| no | 25 | 48.1 | 27 | 51.9 |
| Total | 137 | 62.8 | 81 | 37.2 |

$\chi^2 = 6.377$ (p<0.012)

4. DISCUSSION

This study was therefore undertaken to investigate factors that influence seat belt use among Malaysian car users. This study shows compliance to seat belt law was higher among drivers with 62.8% comply compared 37.2% not comply.

The relationship between travel distance and compliance level of seat belt use is an interesting area to be studied. Low rates of seat belt use are also attributed to the low perceived risk of being involved in an accident. This is based on risk compensation, which postulates that under certain conditions individuals compensate for reduced risk by acting more carelessly and recklessly. Based on this concept, when drivers wear safety belts, they feel safer and exhibit more risky driving behaviors than they otherwise would, thereby reducing the beneficial effects of belt use.

In this study, results show that respondents felt that the seat belt is only needed for those traveling in long distance to protect them in the car. Thus respondents who felt that seat belts are only needed for those traveling at long distance are less likely to comply with the seat belt use law. The other possible reason could be that the duration in a car is always higher among drivers, followed by front seat passengers and rear seat passengers. As such, a person with a shorter time stay in a car (passengers) may find it uncomfortable or think it is unnecessary to use the safety belt compared to the driver who has to stay all the time in a car (Raha, *et al.* 2004).

The study also suggests that there is a strong relationship between compliance level of seat belt use and driving location. Results from this study show that car users driving in city-centers were more likely to comply with seat belt use compared with car users driving in outside city-centers. This could be due to car users' perception of lower enforcement activity outside city-centers compared with city-centers. Usually, enforcement activity tends to be lower outside city-centers due to limited resources and the larger spatial coverage to be

undertaken by enforcement teams. This explains the lower compliance level outside city-centers. This could be due to risk perception among car users that the driving on outside town location carries a much higher risk compared to town centre. This finding is supported by Raha, *et al.* (2004) showing that safety belt usage in town centre was higher compared with the outside town.

A complete non-use of seat belt among rear passengers in Malaysia could also be attributed to the seat belt law which only covers driver and front seat passengers and does not make seat belt use mandatory for rear passengers. This could be due to respondents who perceive the risk of injury in the rear seat as so low that it did not warrant using a seat belt. Besides, in the event of a crash, an unrestrained rear seat occupant may be projected forward, increasing the risk of injury for front seat occupants. Thus a useful strategy is to encourage the front seat occupants to insist that rear seat passengers are restrained, for the protection of both the rear and front occupants. Enforcement activities are widely expected to move along with the number of vehicle movements.

Lastly this paper discusses the relationship between compliance level to seat belt use and enforcement which has been well documented by various researchers. It is a known fact that as enforcement activities increase, the compliance rates to traffic rules will also increase. This study also obtained a similar trend. In this study it was found that when enforcement activities were carried out and police presence was visible, there was compliance to seat belt use. Thus the presence of enforcement activities by police is able to reduce violations and increase compliance. This confirms that enforcement is a powerful way to change motorist behaviors, although admittedly the effect may be short lived.

5. CONCLUSIONS

It is universally accepted that vehicle crashes cannot be totally prevented, but that the resultant injuries and severity can be prevented or minimized by protective devices like seat belts for car occupants especially car drivers and front passengers. Based on the findings, it can be concluded that the contributing factors that influence the compliance behaviors to seat belt use in Batu Pahat. Therefore, road safety programs should be focused on front and rear passengers, low educated drivers and passengers, 10 km and below distance, those traveling in outside city-centers based on their lower practice of using safety belt and those respondents have not been caught for violation of safety belt laws.

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