SUPERVISION FROM MANAGEMENT TO UNSAFE BEHAVIOR DRIVERS

Dr. Buchari Lapau MD, MPH, Yarmasyah, Ir, MKes, Dr. Santoso MD, MS, SpOk
Pekanbaru Hang Institute of Health, Riau, Indonesia

ABSTRACT

Background: Unsafe behavior driver is a driver’s risk measures undertaken in all forms of traffic conditions can be or potentially cause an accident. Chevron Pacific Indonesia has conducted behavior based safety (BBS) to solve the problem of unsafe behavior. A survey conducted to 30 drivers at the A Corporation found that 80% of drivers indicate unsafe behavior. Objective: to detect the factors associating with unsafe behavior drivers at the A Corporation. Material and Methods: the design type was analytic cross sectional study. Population of study was 300 drivers working for the A Corporation. Sample size was 215, calculated based on the design type of analytic cross sectional study, and it was taken from the population through systematic random sampling. Data of several independent variables and one dependent were collected through structured interview by using questionnaire containing close ended questions. Analysis of one variable, two variables and multiple logistic regression analysis was conducted to detect dominant variables associated with unsafe behavior. Results: Less supervision from management to drivers was more risky 5.7 times to have unsafe behavior driver compare to sufficient supervision (CI 95%: OR = 1, 1-34, 3). There was one confounding variable namely perception. Conclusion: Less supervision from management to driver affects unsafe behavior driver compare to sufficient supervision from management to driver. To decrease unsafe behavior driver, the management of the A Corporation has to conduct sufficient supervision especially to motivate drivers having positive perception on behavior based safety (BBS).

Key words: Unsafe Behavior, Driver, BBS Program, Supervision, Perception

INTRODUCTION
Unsafe behavior driver is a driver’s risk measures undertaken in all forms of traffic conditions can be or potentially cause accident. Unsafe behavior is also called at risk behavior. Unsafe behavior occurring in a driver causes accidents including occupational accident. Most of occupational accidents (80%-95%) are caused by unsafe behavior (Cooper, 2001). Occupational accidents are caused by unsafe behavior (88%), unsafe condition (10%) and unknown (Heinrich, 1980). unsafe behavior (Cooper, 2001). Occupational accidents are caused by unsafe behavior (88%), unsafe condition (10%) and unknown (Heinrich, 1980).

*This article was presented at the IIER International Conference held in Malacca, Malaysia on 15th February 2016.

To decrease the occurrence of transportation accidents, it is necessary to use behavioral approach of driving which is called Behavior Based Safety (BBS) namely a program changing at risk behavior to be safe behavior (Heinrich, 1980). The objective of BBS is to motivate the occurrence of behavioral change of every individual human. There are 3 main factors (Green, 1980) affecting behavior namely predisposing factors (knowledge, attitude, perception, convinced, age and sex), enabling factors (environment, training) and reinforcing factors (supervision, regulation, leadership and reward). Among all factors, there are management factors namely supervision, regulation, leadership, reward and training.

Chevron Pacific Indonesia (CPI) Corporation which is a large company in Indonesia has applied the BBS program decreasing transportation accidents for the company’s workers in certain working area since the year of 2010. The one company collaborates with the CPI Corporation is the A Corporation which conducts BBS namely behavior based safety (Yarmansyah, 2015). BBS consists of 9 criteria namely no travel planning, no pre-trip inspection, without using safety belt, high velocity driving, no keeping distance between the car, pedal brake suddenly, inappropriate moving traffic lane, no wide and far look, and inappropriate going back. The driver is unsafe behavior if he has 5 criteria of BBS or more, and he is save behavior driver, if he has less than 5 criteria of BBS.

On 10 – 11 February 2015, the first survey was conducted by the Chevron Pacific Indonesia Corporation for 30 drivers of the A Corporation implementing Behavior Based Safety program; it found that only 20% of drivers indicating to follow BBS and 80% of drivers indicate that they do not follow BBS (unsafe behavior). The question is what factors are associated with unsafe behavior at A Corporation?

To answer the question mentioned above, the literature study was conducted from which the theoretical framework (hypothetic association between several factors and unsafe behavior) is formulated, followed by conceptual framework (hypothetic association between several independent variables and unsafe behavior). An independent variable is operational of a factor; some or all factors from theoretical framework may become independent variables in conceptual framework, which is followed by formulation of specific research problem namely the question whether each independent variable is associated with unsafe behavior. Data from one or more independent variables in conceptual framework which cannot be collected in the field will not appear in specific research problem. Based on the specific research problems, the research objective is as follows: To examine the association between driver’s (knowledge, attitude, perception, age) and management ( training, supervision, regulation) with unsafe behavior driver at the A Corporation.
MATERIAL AND METHODS
This study applies Red Line (Lapau, 2015) or systematic study namely continuation of thinking starting from the title, objective, methods (type of study design, population, sample size calculation, sampling procedure and data analysis), results, discussion on quality and accuracy of data, causal relationship, implication, conclusion followed by recommendation and suggestion (Lapau, 2013). The implication uses the causal relationship directed to conclusion and recommendation. Conclusion contains development of knowledge, while the recommendation contains how to solve the finding problems. Based on the recommendation, suggestion is formulated through inter and multidiscipline approach producing innovative work for Master degree, and through inter, multi and trans-discipline approach producing creative and original work for Doctoral degree as expected by Indonesian Qualification Framework (IQF) confirmed by the President of Republic of Indonesia in January 2012 (Direktorat Jenderal Pendidikan Tinggi, 2011).

Based on the objective of study, the design type of study is analytic cross sectional (Lapau, 2013), where independent variables and the dependent variable are collected at the same time to the drivers of the A Corporation. The dependent variable is unsafe behavior driver. The independent variables belong to drivers (knowledge, attitude, perception and age), and management (training, supervision, regulation). Each independent variable is categorized to be risky category and normal category as follows: knowledge is less and sufficient, attitude is negative and positive, perception is negative and positive, age of driver is < 50 years and > 50 years, result of training driver is “do not yet understand” and “understand”, supervision is less and sufficient, and regulation is “not adherence” and adherence.

Population of study is all (300) drivers working for the A Corporation. Sample size is calculated according to the design type of analytic cross study (WHO, 1986) for each of the 7 independent variables. In this case alpha error is 5% and beta error is 10%. The largest sample size is 211 for the independent variable “attitude”, but the sample size is decided to be 215 for this study. The sample of 215 drivers are taken from the population by systematic random sampling (Ariawan, 1998).

Primary data concerning one dependent variable and 7 dependent variables as mentioned above are collected from 215 drivers of the A corporation. The technique of data collection is structured interview using the questionnaire consisting of close ended questions (Fisher et al, 1983). Planning of data collection consists of 3 phases, 1) Phase 1: permission for the process of data collection, 2) Phase 2: collection of data; 3) Phase 3: handling of data (Varkevisser et al, 1970)

Analysis of data consists of one variable, two variables and multiple logistic regression (Mitra, 2015). The objective of one variable analysis is to describe frequency distribution of each category of variable, and to detect homogenous variable where the one of its categories is less than 15%. The objective of two variable analyses is to detect significant association between one independent variable and one dependent variable by calculating prevalence odds ratio (POR) at confident level of 95% (CI 95%). If (CI 95%: POR = > 1 - > 1) means significant association (danger); If (CI 95%: POR = < 1 - > 1) means no significant; If (CI 95%: POR = < 1-< 1) means significant (protection). The objective of multiple regression analysis is to detect confirmed independent variables associated with one unsafe behavior by conducting two phase namely bivariate selection and multivariate modeling. Multivariate modeling may find confounding variable.
RESULT OF STUDY

Analysis: The analysis of one variable does not show any homogenous variable. The analysis of two variables shows significant association between each independent variables and unsafe behavior driver. The multiple logistic regression analysis shows that less supervision from management to drivers is more risky to have unsafe behaviour drivers 6.1 times compare to sufficient supervision from management to drivers (CI 95%; OR= 1.1-34.3); in this case perception of drivers on BBS is confounding to the supervision from management to the drivers (Table 1).

Table 1

Multivariate Analysis (7th or Last Model) Factors Associated With At Risk Behavior of Drivers at A Corporation

<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>p value</th>
<th>POR</th>
<th>(95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge</td>
<td>0.054</td>
<td>0.173</td>
<td>(0,029 – 1,025)</td>
</tr>
<tr>
<td>Attitude</td>
<td>0.153</td>
<td>2.491</td>
<td>(0,712 – 8,716)</td>
</tr>
<tr>
<td>Perception</td>
<td>0.679</td>
<td>0.835</td>
<td>(0,359 – 1,959)</td>
</tr>
<tr>
<td>Training</td>
<td>0.179</td>
<td>1.774</td>
<td>(0,769 – 4,090)</td>
</tr>
<tr>
<td>Supervision</td>
<td>0.039</td>
<td>6.127</td>
<td>(1.095 – 34.274)</td>
</tr>
<tr>
<td>Regulation</td>
<td>0.066</td>
<td>2.730</td>
<td>(0.937 – 7.958)</td>
</tr>
<tr>
<td>Age</td>
<td>0.871</td>
<td>1.055</td>
<td>(0.202 - 5.382)</td>
</tr>
</tbody>
</table>

DISCUSSION

Quality and accuracy of data: Quality of data consists of relevancy and validity of data; accuracy of data consists of relevancy, validity and reliability of data (Lapau, 2013). Validity consists of external validity and internal validity. External validity indicates how far the result of study from representative sample can be generalized to the population where the sample is taken. Since representative sample exist in this study, because there was conducted systematic random sampling, the result of study can be generalized to 300 drivers at the A Corporation. Internal validity consists of random error and systematic error. Random error consists of alpha error and beta error. In this study, by using alpha error is 5% and beta error is 10%, the sample size is 211. Bias consists of selection bias, information bias and confounding bias. Based on population of 300 drivers in the A Corporation, there is no selection bias; data collection was conducted as best as possible to decrease information bias. Confounding bias occurs because perception of drivers on BBS is confounding to supervision from management to drivers.

Causal relationship: Based on the result of multiple logistic regression analysis, supervision from management to driver is associated with unsafe behavior driver. Based on Hill criteria (Beaglohole et al, 1999), Table 2 shows that association between supervision and unsafe behaviour is based on theory (plausibility +),
Table 2
A Causal Relationship Between Independent Variable and The Occurrence of Unsafe Behavior At The A Corporation

<table>
<thead>
<tr>
<th>No.</th>
<th>Hill Criteria</th>
<th>Independent Variable</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Temporal</td>
<td>+/-</td>
</tr>
<tr>
<td>2.</td>
<td>Plausible (logical)</td>
<td>+</td>
</tr>
<tr>
<td>3.</td>
<td>Dose Response Relationship (based on continues data)</td>
<td>-</td>
</tr>
<tr>
<td>4.</td>
<td>Strength of Association (POR= prevalence odds ratio)</td>
<td>6.1</td>
</tr>
<tr>
<td>5.</td>
<td>Consistency</td>
<td>+</td>
</tr>
<tr>
<td>6.</td>
<td>Design Type of Study (analytic cross sectional)</td>
<td>--</td>
</tr>
</tbody>
</table>

Explanation
+ means there is causal relationship
+/- means there may be or may not be causal relationship
- means there is no causal relationship

strong significant (CI 95%: OR=1.1-34.3), and consistent; so it can be justified there is causal relationship between supervision from management and unsafe behavior drivers.

![Diagram: Supervision to At-Risk Behavior with Perception]

Figure 3 Causal Relationship between Supervision from management to driver and unsafe behavior driver

Implication of study: Supervision from management to drivers has causal relationship with unsafe behavior drivers: less supervision from management to the drivers affects unsafe behavior driver compare to sufficient supervision from management to the drivers. In this case perception of drivers on BBS is confounding to the supervision from management to the drivers: negative perception of drivers on BBS is associated with less supervision from management to drivers (see Figure 3). To prevent unsafe behavior driver, the management of the A corporation has to conduct sufficient supervision especially to motivate drivers to have positive perception on behavior based safety (BBS). Based on the recommendation, suggestions are formulated through inter and multidiscipline approach. Formulation of recommendation is based on scientific discipline epidemiology and biostatistics. Supervision is activities studied by the discipline of health policy administration. Perception is a concept belongs to the discipline of health promotion. The suggestion should be developed and formulated through inter and multi-discipline approach.

http://www.iaeme.com/IJM/index.asp 257 editor@iaeme.com
CONCLUSION, RECOMMENDATION AND SUGGESTION
Conclusion: Less superision from management to drivers affects unsafe behavior drivers. To prevent unsafe behavior drivers, it is recommended so that management of the A Corporation has to conduct sufficient supervision especially to motivate drivers to have positive perception on behavior based safety (BBS). It is suggested 1) To intensify supervision system according to policy of the A Corporation; 2) To give reward for the save behavior driver; 3) To conduct punishment for unsafe behavior driver; 4) to plan and implement on the job training for motivation of drivers having positive perception on BBS.

ACKNOWLEDGEMENT
Acknowledgement go to Mr. Zainal Abidin, MD, MPH, Rector of Pekanbaru Hang Tuah Health Institute, who decided to fund the implementation of this study, and presentation of the result of study in the IIR International Conference held in Malacca, Malaysia on 15th February 2016.

REFERENCES