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RESEARCH ARTICLE

KNOWLEDGE AND COMPLIANCE WITH TRAFFIC RULES AMONG DRIVERS IN CAGAYAN

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Abstract

Due to the rising incidence of road traffic accidents (RTAs) in the province of Cagayan, the study was conducted to generate scientific information that are vital in promoting road safety in the province. Records of Cagayan Police show 2,679 cases of road accidents from 2015-2016 involving motor vehicle. Respondents were 322 drivers of public utility vehicle and private motor vehicle involved in road accident. The study assessed the drivers' level of knowledge and their extent of compliance with traffic rules. Findings indicate that respondent drivers have a "very high" level of knowledge on rules on overtaking; parking; drunk and distracted driving; use of seatbelt and helmet and interpretation of danger warning and informative signs but have "low" level of knowledge on right of way rules. They "moderately" comply with traffic rules on pavement markings, but as a whole, they comply "much" with traffic rules. Moreover, results indicate a positive relationship between level of knowledge and extent of compliance with traffic rules. From the findings, it is concluded that the drivers are conversant with most of the traffic rules and are potentially inclined to obey them except right of way rules and rules under pavement markings hence, their involvement in RTAs.Based on the findings, it is recommended that: drivers education be strengthened and the rules on right of way and the meaning of pavement markings be given emphasis during the conduct of driver's education; intensification of patrol along accident prone areas and installation of electronic devices to detect traffic violations.

Introduction:-

Road Traffic Accidents commonly defined as the collision of vehicles, pedestrian, or with an object that will result in death, disability and damage to property is one of the significant challenges faced by most countries worldwide. It has been one of the major causes of human and economic losses both in developed and developing countries (Ngeleja, 2015) The National Statistics Office of the Philippines in its 2014 report, recorded that from year 2010-2012 there were 43,306 totals of RTA happened and 34,313 of which is attributed to human factor or error that includes bad overtaking, over speeding, bad turning, overloading, hit and run, drunk driving, using cellular phone while driving and self-accidents (Transportation Philippines Yearbook, 2014).

In the Cagayan Valley Region, RTA is identified as the number 6th mortality leading causes in 2013 with a rate of 29.87 per 100, 000 populations. The province of Cagayan is one of the leading from among the five (5) provinces in the region as far as accident rate is concerned (Cagayan Valley Statistical Yearbook, 2013).

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Cagayan is a province of the Philippines in the Cagayan Valley Region. It is situated at the Northeastern corner of the island of Luzon. It borders Ilocos Norte and Apayao to the West, and Kalinga and Isabela to the South. According to the 2015 census, the province has a total population of approximately 1,199,320 which gives an overall population density of about 130 people per square kilometer (Cagayan and Political Subdivisions, 2015).

Based on the records from the Cagayan Police, there are 2,679 cases of RTAs from year 2015-2016 which involved 2,828 motor vehicles. This figure is said to be lower since, accidents that result in minor injuries or damage to property are usually not reported to the police and due to the incompleteness of data being submitted by local police authorities.

One of the most tragic road accidents in Cagayan that happened was on September 2003 when a passenger bus collided with another bus and a van before plunging into a ravine that killed at least 14 people and injuring 31 along a winding mountainous road in Gattaran town. Another fatal accident happened on February 15, 2010 in Piat Cagayan when a passenger jeep and a truck collided with each other killing fourteen (14) people; mostly students and thirteen (13) were injured (Lagasca, 2010).

The rising incidence of road traffic accidents (RTAs) within the province needs appropriate action and intervention measures to improved road safety hence, this study.

Objectives of the study:
This study has been initiated to: 1) Assess the level of knowledge of the drivers with the traffic rules; 2) Assess the extent of compliance of the drivers with the traffic rules and; 3) Determine whether there is a significant relationship between the level of knowledge and the extent of compliance of the drivers on traffic rules?

Statement of the Problem:
In order to attain the objectives of this study, the following three main questions are propounded.
1. What is the level of knowledge of the drivers with the traffic rules?
2. What is the extent of compliance of the drivers with the traffic rules? And
3. Is there a significant relationship between level of knowledge and extent of compliance of the drivers with the traffic rules?

Methodology:-

Research Design:
The study uses the descriptive and correlation research design since it measures the level of knowledge and extent of compliance of the drivers with the traffic rules and determines the relationship between drivers' level of knowledge and extent of compliance with traffic rules.

Population and Locale of the Study:
A sample size of 322 was selected through a purposive random sampling from a total of 2,205 licensed drivers involved in RTAs in Cagayan. The sample size of 322 was determined using the Table of Required Sample Size from The Research Advisors (2006) with a confidence level of 95% and a margin of error of 5.0% (The Research Advisor, 2006). Drivers involved in RTAs issued with student permit and unlicensed were excluded since they do not have actual knowledge of traffic rules. Licensed drivers who suffer mutilation or grave injury like loss of hearing, inability to speak or write as a result of the accident were not included for ethical grounds.

Data GatheringTools:
The data were collected through a survey questionnaire. The questionnaire consists of two (2) parts. Part I is composed of fifty-five (55) items multiple choice type examination designed to measure driver's knowledge of traffic rules. Said questionnaire was tested and validated. Part II consists of questions aimed at assessing the driver's extent of compliance with the traffic rules. All questionnaires were formulated based on Republic Act 4136 or the "Land Transportation and Traffic Code of the Philippines.

Data Gathering Procedure: The questionnaire were personally administered and retrieved by the researcher. The address of the respondent drivers was traced through the official records of the Investigation Section of the Cagayan Police. Attached to the questionnaires is the consent form explaining the role of the respondents to include their freedom to choose either

toparticipate or not in the study. For ethical grounds, personal information, result of examination, responses, and data given were treated with utmost confidentiality.

Treatment of the Data:
In measuring the driver's level of knowledge with traffic rules, frequency count was used. In interpreting the level of driver's level of knowledge with traffic rules, the following scale was utilized.

Area Scores (N=322)	Overall Scores (N= 322)	Verbal Interpretation
1,207.6 - 1,610	13,282.6 – 17,710	Very High
806 - 1,207.5	8,855.1 – 13,282.5	High
402.6 - 805	4,427.6 – 8,855	Low
0 - 402.5	0 - 4,427.5	Very Low

The number of the respondents was multiplied by the number of items in the examination and divided into four (4) which corresponds to the level of knowledge provided which is very low, low, high and very high depending on the scores they got in the test. To measure the extent of compliance of the drivers with traffic rules, mean and weighted mean were used.

To interpret and analyze the extent of compliance of the respondent drivers with traffic rules a four-point Likert scale was used:

Numerical Values	Mean Range	Verbal Interpretation
4	3.26-4.00	Very Much Complied
3	2.51-3.25	Much Complied
2	1.76-2.50	Moderately Complied
1	1.00-1.75	Not Complied

Spearman's Rho Correlation Coefficient was used to analyze the Drivers' level of knowledge and extent of compliance with traffic rules.

The Intraclass Correlation Coefficientguidelines were used in determining relationship between level of knowledge and extent of compliance with traffic rules (Cicchetti, 1994).

Range of ICC Values	Descriptive Interpretation
0	No Correlation
.01 - .20	Very Low Correlation
.21 - .40	Low Correlation
41 – .60	Moderate Correlation
.61 - .80	High Correlation
.81 - .99	Very High Correlation
1.0	Perfect Correlation

Results and Discussion:-

Table 1:- Drivers' Level of Knowledge on Traffic Rules. (N=322).

	Traffic Rules	Area Scores	Descriptive Interpretation
a.	Rules on Speed Limit	1,167	High
b.	Rules on Overtaking & Passing	1,329	Very High
c.	Rules on Right of Way	780	Low
d.	Rules on StartingTurning & Stopping	1,097	High
e.	Rules on Parking	1,317	Very High
f.	Required Motor Vehicle Accessory	1,052	High
g.	Other Traffic Rules	1,467	Very High
h.	Regulatory Signs	1,168	High
i.	Danger Warning Signs	1,388	Very High
j.	Informative Signs	1,400	Very High

k.	Pavement Marking	971	High
Over-all Scores	**13,136**	**High**	

As shown in Table 1, an over-all score of 13,136 means "high" indicates that the drivers have substantial knowledge with traffic rules. This further indicates that drivers involved in vehicular accident are knowledgeable with most of the traffic laws.

A score of 1,467 indicates that the drivers have a "very high" level of knowledge with other traffic rules like drunk and distracted driving and use of seatbelt and helmet. A score of 1,400 shows that the drivers have a "very high level of knowledge on interpreting informative signs such as signs indicating the locations of first aid stations, hospitals, parking areas and destination markers.

Moreover, a score of 1,388 displays that the drivers have a "very high" level of knowledge on interpreting danger warning signs such as signs on ongoing road construction, school zones, narrow roads, intersection warnings, slippery roads and other dangerous road sections. Furthermore, a score of 1,329 manifests that the drivers has a "very high" level of knowledge with the rules on overtaking and passing. Likewise, a score of 1,317 points out that the drivers have a "very high" level of knowledge of rules on parking. It means that the drivers know very well the specific areas where parking is prohibited. The results imply that the mentioned traffic rules where respondent drivers have a "very high" level of knowledge are emphasized during driver's education. Moreover, the respondent drivers have extensive knowledge of these traffic rules since it is commonly enforced by the traffic enforcers.

A score of 1,167 shows that the drivers have a "high" level of knowledge with traffic rules on speed limit. It implies that the drivers are familiar with the existing speed limit. Similarly, a score of 1,097 means "high" indicates that the drivers are conversant on the rules on starting, turning, and stopping. It infers that they can recognize the mandatory starting, turning and stopping procedures like the use of visual and audible signals. Likewise, a score of 1,052 shows that the drivers have a "high" level of knowledge with the traffic rules on required motor vehicle accessories. It means that the drivers are knowledgeable with all the accessories of the motor vehicle that must be fulfilled. On the other hand, a score of 1,168 indicates that the drivers have a "high" level of knowledge with traffic rules on regulatory signs. It further implies that the drivers can interpret the meaning of regulatory signs such as no overtaking, no parking, no "u" turn, left and right turn, give way sand signs on maximum speed limit.

Moreover, a score of 971 indicates that the drivers have a "high" level of knowledge on pavement markings. It implies that the drivers can interpret the meaning of pavement markings like the single and double continuous line, stop and pedestrian crossing lanes.

However, a score of 780 being the lowest indicates that the drivers have a "low" level of knowledge on rules on right of way. It implies that the respondents are confused with rules on right of way. It further implies that rules on right of way were not emphasized during driver's education and examination.

Table 2:- Extent of Compliance of the Drivers on Traffic Rules. (N=322) .

Traffic Rules	**Weighted Mean**	**Descriptive Interpretation**
a. Rules on Speed Limit	2.77	Much Complied
b. Rules on Overtaking & Passing	2.97	Much Complied
c. Rules on Right of Way	2.85	Much Complied
d. Rules on Starting, Turning & Stopping	3.35	Very Much Complied
e. Rules on Parking	2.78	Much Complied
f. Required MotorVehicle Accessory	3.50	Very Much Complied
g. Other Traffic Rules	2.82	Much Complied
h. Regulatory Signs	2.81	Much Complied
i. Danger Warning Signs	2.90	Much Complied
j. Informative Signs	2.90	Much Complied
k. Pavement Markings	2.45	Moderately Complied
Overall Weighted Mean	**2.92**	**Much Complied**

The over-all mean of 2.92 means "much complied" indicates that the respondent drivers observed with considerable degree the traffic rules. It is inferred that they usually obey most of the traffic rules, but not to the fullest degree which in most cases perpetuates their involvement in accidents. Moreover, the data suggest that to prevent road accidents, compliance with all the existing traffic rules shall be absolute and observe to its fullest extent rather than optionally and superficially observe.

An area mean of 3.50 and 3.35 being the highest mean indicates that the drivers are "very much" compliant with the provision of required motor vehicle accessories along with the rules on starting, turning, stopping. It implies that the drivers always ensure that their vehicles are equipped with the necessary safety accessories like headlights, tail lights, functional dual hydraulic brake and side mirrors. It indicates that most motor vehicles involved in road accidents in the province have the required necessary safety accessories such as those mentioned. This further manifests that road accidents that occurred within the Province are not due to vehicle factor. Moreover, the respondent drivers always follow safety measures when starting, turning and stopping their vehicles and ensure that such movement made in safety. This further implies that they use plainly visible and audible signals, proper maneuvering procedure when about to stop, while entering to the roadway and when attempting to change their courses of direction.

An area mean of 2.45 being the lowest indicates that the drivers "moderately" comply the traffic safety rules embodied on pavement markings. It denotes that they display indifference with the meaning of pavement markings and usually fail to follow traffic safety regulations on pavement markings. This further implies that most drivers overtake in horizontal or vertical curves, residential or business districts and on foot of bridges and tend to disregard pedestrian crossing lane which is a manifestation of ignoring of one's safety and safety of other road users. Hence, their failure to follow traffic safety rules under pavement markings is one of the underlying causes of driver's involvement in road accidents.

Table 3:- Correlation on the Level of Knowledge and Extent of Compliance of the Drivers on Traffic Rules Using Spearman's Rho (N=322).

Land Transportation And Traffic Rules	Spearman's Rho Correlation(ρ)	Interpretation of Correlation Values	p-value
a. Rules on Speed Limit	0.04	Very low Positive	0.468
b. Rules on Overtaking & Passing	0.19	Very low Positive	0.001**
c. Rules on Right of Way	0.16	Very low Positive	0.004**
d. Rules on Starting, Turning & Stopping	0.06	Very low Positive	0.265
e. Rules on Parking	0.17	Very low Positive	0.002**
f. Required Motor Vehicle Accessory	0.17	Very low Positive	0.002**
g. Other Traffic Rules	0.01	Very low Positive	0.869
h. Regulatory Signs	-0.11	Very low Negative	0.059
i. Danger Warning Signs	0.10	Very low Positive	0.070
j. Informative Signs	0.07	Very low Positive	0.244
k. Pavement Markings	0.14	Very low Positive	0.011*
Overall	**0.21**	**Low Positive**	**0.000****

*Significant at the 0.05 level ($p<0.05$)
**Highly significant at the 0.01 level ($p<0.01$)

Results of the bivariate correlation between the level of knowledge and extent of compliance of the drivers on the different areas of traffic rules indicates that most correlation values are not significant except for b. Rules on Overtaking and Passing ($\rho=0.10$, $p<0.01$), c. Rules on Right of Way ($\rho=0.16$, $p<0.01$), e. Rules on Parking ($\rho=0.17$, $p<0.01$), f. Required Motor Vehicle Accessory ($\rho=0.17$, $p<0.01$), k. Pavement Markings ($\rho=0.14$, $p<0.05$). These are indicative of the fact that some of the areas where the drivers are knowledgeable specify that they are also compliant.

Moreover, the data suggest that there is a very low negative relationship between drivers' level of knowledge and extent of compliance with the rules embodied on"regulatory signs." This means that the higher the level of knowledge of the drivers with the said traffic rule, the lower is the level of their compliance. This further manifest that the drivers can interpret the meaning of regulatory signs such as the no overtaking, no parking, no "U" turn, no

left turn and no right turn, give way and regulatory speed limit signs, however, they tend not to comply with the said traffic rules. This further implies that whether the drivers are knowledgeable about the said traffic rule, there is no guarantee that they will follow the same. The overall correlation coefficient of (ρ=0.21, $p<0.01$) indicated that the driver's level of knowledge with the land transportation and traffic rules is related to their extent of compliance. However, this relationship is not so evident when scrutinized using the scatterplot (Figure 1).

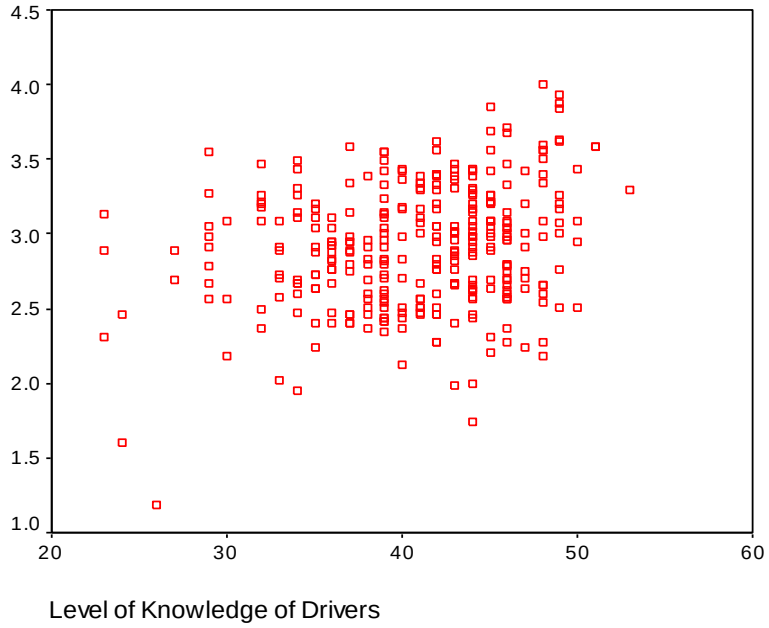

Figure 1:- Scatter Plot Showing the Relationship Between the Level of Knowledge and Extent of Compliance of the Drivers on Traffic Rules.

The figure indicates that there is a positive relationship between driver's level of knowledge and their extent of compliance with the traffic rules but the relationship is said to be low. Nonetheless, it can be construed that to some extent, the higher the level of knowledge of the drivers on traffic rules the higher is their level of compliance also.

Findings yielded are supported by Mendoza (2006) who established that if a driver has a more driver's training and knowledge of traffic rules, the driver has low risk and weak intention to commit a traffic violation. The opposite can be said for drivers with limited driver's training and knowledge.

Recommendations:-

1. Right of way rules and the meaning of pavement markings must be given emphasis during the conduct of driver's education for all applicants of driver's license;
2. Driver's education as pre-requisite for the issuance of driver's license should not focus only on the basics of driving but more so in improving driver's attitude towards driving, apathy towards signs and markings;
3. Intensify traffic patrol along identified accident prone areas to deter over-speeding and other moving traffic violations and;
4. CCTV cameras shall be installed to reinforce traffic enforcers in detecting violations and to deter would-be violators.

Conclusion:-

From the findings, it is concluded that the drivers are conversant with most of the traffic rules and are potentially inclined to obey them except right of way rules and rules under pavement markings hence, their involvement in Road Traffic Accidents (RTAs).

Moreover, it is concluded that traffic safety education is very indispensable to effectively addressed traffic accident problems and improved road safety within the province.

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