

IDENTIFICATION OF THE MOST EFFECTIVE FACTORS AFFECTING AVERAGE SEAT BELT USAGE RATES IN SRI LANKA

S.D.N. Ariyawansa, R.M.A.R. Bandara, S.P.G.L. Jayawardena and V. Wickramasinghe

Department of Civil Engineering, University of Peradeniya

Introduction

A seat belt is a safety harness designed to secure the occupant of a vehicle against harmful movement that may result from a collision or a sudden stop. Sixty-three percent of people who killed in accidents were not wearing seat belts in USA in 2005. Wearing a seat belt is still the single most effective thing that can be done to save lives and reduce injuries (car accidents attorneys). Yet, merely 11% of the Sri Lankan drivers wear seat belts (Wickramanayake *et al.*). In that context, an attempt is made in this research to model seat belt usage rate with the intention of identifying the significant contributing factors towards increasing average seat belt usage.

Methodology

Existing literature related to seat belt usage in Sri Lanka and other countries was reviewed in detail to find the variables affecting seat belt usage. According to the literature, variables that affect seat belt usage could be broadly divided as following categories; socio-economic factors (e.g., gender, age, civil status, level of education, monthly income, etc.), vehicle characteristics (e.g., ownership of the vehicle, type of the vehicle, type of passengers, availability and workability of seat belts, average speed of driving, etc.), and driver behavior (e.g., existing law related to the seat belt usage, policies of insurance companies for accident claims). Further, open ended questions (e.g., past

accident experiences, knowledge on the importance of wearing seat belt and law regarding seat belt, etc.) would suggest personal opinions on seat belt usage.

Data collection was carried out using an interview-based questionnaire. Next, a spread sheet was prepared with the collected data sample. The data was analyzed in two ways. First a descriptive analysis was performed followed by a model fitting. Several models were studied and finally a multiple linear regression model was selected to fit the data. The significant of the factors affecting seat belt usage in Sri Lanka were assessed using a statistical test (i.e., t-test).

Data Collection

The annual convocation day of the University of Peradeniya was selected to conduct the questionnaire. Besides, the questionnaire was also distributed to the staff of hospitals, school teachers, university staff and students. Altogether, four hundred and ninety (490) respondents were answered for the questionnaire. The collected data consisted of 83.1% and 16.9% male and female respondents respectively.

Data analysis and model fitting

Frequency of seat belt usage was taken as the dependent variable for the model. The answers for this variable were "always", "sometimes", and "never". Table 1 shows the basic variable details taken from the questionnaire

Table 1 Description of the variables

Variables	Descriptions	%	Mean	Variables	Descriptions	%	Mean
Gender	0= Male	83.1	0.17	Workability of seat belts	1=Yes	80	0.8
	1= Female	16.9			0=No	20	
Age	0=<25	32.8	0.95	seat belts use frequency	2=always	15	0.68
	1=25-45 yrs	44.2			1=sometimes	39	
	2=45-60 yrs	18.1			0=rarely or never	46	
	3=>60 yrs	4.9			0= long distance traveling	56	
Civil status	0=Married	58.6	0.41	If seatbelt use some time	1=short distance traveling	4	0.89
	1=Unmarried	41.4			2= high speed traveling	35	
Level of education	0= up to grade 8	14	1.72	If seatbelt use never	3=other	5	1.73
	1= up to O/L	31			0=Seatbelt is not working	7	
	2=up to A/L	25			1=feels discomfort	39	
Monthly Income	3=Higher education	30	0.52	knowledge on importunacy of seat belts	2=Due to busyness	11	0.76
	0= < Rs 20,000	61			3=Doesn't know the importance	21	
	1=Rs 20,000-35,000	26			4=other	22	
Ownership of the vehicle	2=> Rs 35,000	13	1.19	From where?	0=Newspapers and books	28	1.86
	0=Own	53			1=Television	22	
	1=Government	3			2=Conferences and seminars	11	
	2=Employer	21			3=From advertisements	12	
Other people travel with respondent	3=Other	23	2.61	Previous accidents met with respondent	4=Other	21	0.26
	4=Family members	46			1=Yes	26	
	3=Relatives/friends	13			0=No	74	
	2=Employer	6			If Yes, were you wearing the seat belts in that moment/s?	1=Yes	
Seating location of the respondent	1=Passengers	32	1.54	Awareness about seat belt law	0=No	84	0.16
	0=Others	3			1=Yes	44	
	2=driving seat	71			0=No	56	
Type of the vehicle	1=front seat passenger	12	0.07	Average speed of driving	0=<50 km/h	22	0.91
	0=Light/Dual purpose	93			1=(50-70) km/h	64	
Driving License Type	0=Heavy vehicle	7	1.34	Avg. distance travels per day	2=> 70 km/h	14	1.08
	0= No driving License	14			0=< 10km	26	
Type of insurance	1= Heavy vehicles	48	0.72	Number of days drive per week	1=(10-50) km	39	0.9
	0= Third party insurance	28			2=> 50 km	35	
Availability of seat belts	1= Full insurance	72	0.85		0=< 3 days	37	
	0=No	15			1=3-5 days	36	
					2=> 5 days	27	

The above arranged categorical variable were inserted into the statistical software (e.g., SPSS) and run the multiple linear regression analysis. The output of the statistical model is shown in Table 2.

The following equation shows the linear regression model which was developed to evaluate the seat belt usage rates in Sri Lanka.

$$USAGE\ RATE = - 0.437 + 0.326*A + 0.049* B + 0.166*C + 0.101*D + 0.165*E + 0.309*F + 0.203*G + 0.085*H \quad (1)$$

where; A: Gender, B: Other people travel with respondent, C: Seating location of the respondent, D: Type of the driving License, E :Type of vehicle insurance, F: Workability of seat belts, G: Awareness regarding seat belt law, H: Average distance travelling in a day.

Discussion and Conclusion

The significant parameters from the developed regression model provide the factors that contribute to Sri Lankan average seat belt usage rates. From the public views and the model results, awareness of law regarding seat belts is one of the main factors. Currently, government involves in fixing up law

regarding seat belt usage. However, the responsible authorized agencies should involve in spreading knowledge about the importance of seat belt usage. For that, educational programs can be launched using news papers, television and seminars arranged by the Department of Motor Traffic. Besides, some kind of reading materials can be added to the school curriculum. According to the research workability of seat belt is also significant factor. There should be some active measures to check the availability of seat belts and their workability. It can be done when taking fitness certificate annually.

References

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- Wickramanayake, L., Gunasena, G.G.A., Wickramanayaka, H.B.P.W. and Goonasekera, C.D.A.(2007). The prevalence of known risk factors for road traffic accidents (RTA) in Kandy police administrative area, Proceedings of the Peradeniya University Research Sessions, Sri Lanka, 12(1): Pp. 129-130

Table 2. Multiple linear regression model output

Model variables	Coefficients				Sig.
	Unstandardized Coefficients		Standardized coefficient	t value	
	B	Std. Error	Beta		
Constant	-0.437	0.127		-3.423	0.001
A	0.326	0.093	0.170	3.518	0.000
B	0.049	0.023	0.096	2.027	0.039
C	0.166	0.05	0.179	3.326	0.001
D	0.101	0.047	0.100	2.139	0.033
E	0.165	0.068	0.103	2.444	0.015
F	0.309	0.08	0.170	3.843	0.000
G	0.203	0.061	0.139	3.332	0.001
H	0.085	0.042	0.091	2.007	0.045