

## Attitude of Drivers Towards Road Traffic Safety and its Association with Occurred Road Traffic Crashes Among Jimma Zone Public Transport Drivers, Southwest Ethiopia

Research Article

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### Abstract

**Background:** Road traffic crash (RTC) has become a global burden. The world health organization's (WHO) global report on road traffic safety of 2015 shows that about 1.25 million deaths observed due RTC which means every 24 seconds someone dies on the road and predicted to become the fifth leading cause of death by 2030. RTC was identified as the leading cause of death especially among young people of 15-29 years, and low and middle-income countries. Attitude of drivers towards road traffic safety (RTS) is one of the most important indicator for RTC which needs due emphasis to tackle this tragedy.

**Methods:** The study was conducted among 398 public transport drivers that selected randomly. Driver Attitude Questionnaire (DAQ) that comprises 16 items was applied to investigate drivers' attitudes towards RTS with four Point Likert-scales (1-4, refers to totally disagree, disagree, agree and totally agree respectively for positive statements and reverse for negative statements where scale 1 belongs to totally agree). The driver was considered to have positive attitude if agrees/accepts items of positive statements and disagree/against items of negative statements. DAQ assesses attitude of drivers towards RTS with its four domains (Alcohol, close following, overtaking and speeding). Cross tabs and binary logistic regression were applied to determine the association of attitude related variables with occurrence of RTC. A p-value less than 0.05 was declared as statistically significant.

**Results:** From the total 398 drivers participated on the study, males accounted 394 (99%). The mean age of the respondents was 32.11±9.133 years that range from 20–60 years. They had an average driving experience of 6.72 years. Majority of participants [219(55.0%)] had less than 5 years of driving experience; More than one third [142 (35.7%)] of the drivers were reported to sustained RTC. From the applied DAQ questionnaires with 16 items to assess drivers attitude towards RTS, about nine items of DAQ variables with negative statements (speed limitation problems, interest of competition, taking risks, perception of obeying regulation as childish, mimicking peer fraud, disobey regulation when no police, attitude about offense punishment, alcohol drinking and overtaking in front vehicles) were statistically significantly associated with the occurred RTCs among drivers. There was statistically significant difference observed among drivers' attitude scores of Likert-scales with occurred RTCs. In nutshell, drivers who sustained RTC (35.7%) were statistically associated with lower scores of Likert-scale (totally agreed) to those items with negative statements.

**Conclusion and Recommendation:** The occurrence of RTC was more likely among drivers with negative attitude/behavior (who agreed/very agreed to items with negative statements and/or who disagreed/very disagreed to items with positive statements) which needs due emphasis for tackling this tragic event in collaboration to enhance drivers attitude towards RTS by providing awareness.

**Keywords:** Road Traffic Safety; Attitude; Drivers; Association; Road Traffic Crash.

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## Introduction

Road traffic crash (RTC) can be defined as an crash that occurs on a way or street open to public traffic, resulting in one or more persons being killed or injured, and involving at least one moving vehicle. It involves all collisions sustained between vehicles, between vehicles and pedestrians, between vehicles and animals, or between vehicles and geographical or architectural obstacles [1].

Globally, RTCs are issue of major public health importance and are projected to be the third leading cause of Disability-Adjusted Life-Years (DALYs) by 2020. In 2010 about 1.24 million people lost their lives in RTCs, making it the eighth leading cause of death globally. Additionally, 20–50 million people were non-fatally injured on the road [2]. The burden of road traffic injuries in Africa is high and there is an underestimation of road traffic fatalities despite 34% increase road deaths in Africa in the past 35 years [3].

Personality traits, attitudes toward traffic safety (RTS), risky driving (errors, lapses, and traffic violations), and self-reported crash involvement and number of issued traffic tickets in the last 12 months showed that risky driving was positively related to self-reported crash involvement and higher number of issued traffic tickets [4]. Increase in attitude and behavior was followed by a decrease in RTC having a crucial effect. Study conducted among Iranian drivers [5]. Personality traits were also associated to aberrant driving behaviors both directly and indirectly where a particular altruism, excitement seeking, and normlessness directly affects drivers' attitudes toward traffic safety which, in turn, were negatively associated with RTCs [6], [7].

In Ethiopia, there is limited of studies on attitude of drivers towards road traffic safety and its association with RTC. Thus, the present study was aimed to assess attitude of drivers towards road traffic safety and its association with occurred RTC among Jimma zone public transport drivers.

## Materials and Methods

The study was conducted in Jimma zone, in the Oromia region, located 352 km away to southwest of the capital city of Ethiopia, Addis Ababa. Jimma zone has 18 woredas/clusters for administration. Jimma zone transport authority registered a total of 7219 vehicles working in public transportation from which about 1352 are three wheel vehicles. About 4446 vehicles are traveling to woreda from capital town of the zone, Jimma while about and 248 vehicles are serving within the town. The study was conducted from March 25, 2019 to April 25, 2019. A Cross sectional study design was used among selected 398 licensed public transport drivers (including drivers of three wheel vehicles) working at different stations, while waiting their turn. Study participants were informed about the nature of the study, and participation was voluntary and anonymous.

Driver Attitude Questionnaire (DAQ) that comprises 16 items (4 statements with positive items and 12 statements with negative items) was applied to assess drivers' attitudes and behaviors towards road traffic safety with four Point Likert-scales (1-4, refers to totally disagree, disagree, agree and totally agree respectively for positive statements and reverse for negative statements (scale-1: totally agree) [8]. It can be also generalized that scale 1 and 2 for

any item implies that the driver had negative attitude/behavior towards that domain while drivers of scale 3 and 4 refers considered to had positive attitude. DAQ assesses attitude of drivers towards road traffic safety with four domains (Alcohol, close following, overtaking and speeding). Cross tabs and binary logistic regression were applied to determine the association of attitude related variables with occurred/sustained RTCs.

Ethical clearance was obtained from Jimma University Review Board (IHRPGD/467/2019) and letter of cooperation was obtained from Jimma Zone transport authority and respective woreda offices. Both verbal and written consent was obtained from each participant before the study. Permission to participate in the study was confirmed by informed them about the research and their right to abandon the involvement was respected at any time, and confidentiality of the information was also maintained.

## Results

### Socio-demographic characteristics of drivers

The totals of 398 drivers were participated in this study making response rate of 99% from the total sample of 402 drivers. The mean age of drivers was 32.11years  $\pm$ 9.133 years that ranges from 20 - 60 years. Majority of them [394(99%)] were males, married [214 (53.8%)], had primary education (54.8%), earned monthly income of 2,000–3,000 Ethiopian birr, had less than 5 years of driving experience [219(55.0%)] and drivers of four-wheel vehicle [337 (84.7%)].

### Drivers Attitude towards road traffic safety

From the total 16 items of DAQ applied, the minimum mean of attitude scale (2.17+1.17 SD) was observed with item of 'traffic offences are punished too severely' indicating that net attitude of drivers towards this item was scale 2 (agree) while the maximum mean of attitude scale (3.65+0.7SD) was seen with item of 'definite obeying of the stop sign' that implies as the net attitude of respondents towards this item was scale 3 (agree).

Among DAQ applied with four Likert scales, majority of the drivers claimed to have positive attitude/ scale 4/ very agree to statements with positive items (obeying stop sign, easy to obey regulations, feeling guilty to fraud and never driving on white line).

In general, the attitude of drivers varies towards different items. But, there is no driver who claimed for scale 2 attitude (disagree) for item 'Minor traffic violations should be punished only in case of crash' as detailed in table 1.

### Association of drivers' attitude towards road traffic safety with occurred road traffic crashes

About 142 (35.7%) of drivers responded as they sustained road traffic crash in their driving career. The associations of drivers' attitude towards road traffic safety with occurred road traffic crashes were established by cross tabs and binary logistic analysis with p-value less than 0.05 considered as statistically significant. Accordingly, about nine items of DAQ variables with negative statements (speed limitation problems, interest of competition, taking risks, perception of obeying regulation as childish, mimick-

Table 1. Drivers attitude towards road traffic safety by DAQ among public transport drivers of Jimma zone 2019.

DAQ Variables	Categories	Frequency	Percentage (%)
Speed limits are mostly unnecessary	Totally agree	198	49.7
	Agree	3	0.8
	Disagree	73	18.3
	Totally disagree	124	31.2
I like competing in a highway traffic	Totally agree	184	46.2
	Agree	7	1.8
	Disagree	78	19.6
	Totally disagree	129	32.4
While in a hurry, I can take risks in traffic	Totally agree	196	49.2
	Agree	10	2.5
	Disagree	101	25.4
	Totally disagree	91	22.9
Driving according to traffic regulation sometimes feels childish	Totally agree	195	49
	Agree	6	1.5
	Disagree	91	22.9
	Totally disagree	106	26.6
I often drive against traffic rules because others do so as well	Totally agree	197	49.5
	Agree	8	2
	Disagree	90	22.6
	Totally disagree	103	25.9
If I know that the police can't see me, I can take a forbidden shortcut	Totally agree	176	44.2
	Agree	28	7
	Disagree	97	24.4
	Totally disagree	97	24.4
In my opinion traffic offences are punished too severely	Totally agree	167	42
	Agree	74	18.6
	Disagree	80	20.1
	Totally disagree	77	19.3
I definitely obey the stop sign	Totally disagree	15	3.8
	Disagree	10	2.5
	Agree	76	19.1
	Totally agree	297	74.6
While drive alone, I take risks	Totally agree	195	49
	Agree	14	3.5
	Disagree	90	22.6
	Totally disagree	99	24.9
In my opinion, the use of the safety belts is unnecessary in urban traffic	Totally agree	162	40.7
	Agree	14	3.5
	Disagree	96	24.1
	Totally disagree	126	31.7
It is easy for me to obey traffic regulations	Totally disagree	14	3.5
	Disagree	12	3
	Agree	78	19.6
	Totally agree	294	73.9
After driving against traffic rules, I feel guiltiness	Totally disagree	46	11.6
	Disagree	9	2.3
	Agree	75	18.8
	Totally agree	268	67.3
Drinking a small amount of alcohol just before driving depends on one's ability	Totally agree	196	49.2
	Agree	5	1.3
	Disagree	84	21.1
	Totally disagree	113	28.4
I try to overtake a car in front of me	Totally agree	162	40.7
	Agree	6	1.5
	Disagree	73	18.3
	Totally disagree	157	39.4
I never drive across the yellow line	Totally disagree	44	11.1
	Disagree	6	1.5
	Agree	73	18.3
	Totally agree	275	69.1
Minor traffic violations should be punished only in case of crash	Totally agree	176	44.2
	Agree	0	0
	Disagree	70	17.6
	Totally disagree	152	38.2

**Table 2. Association of drivers' attitude towards road traffic safety with occurred road traffic crashes among public transport drivers in Jimma zone, 2019.**

DAQ variables	Categories	Occurrence of road traffic crashes (RTC)			OR(95% CI)	P- value
		Yes, No (%)	No, No (%)	Total, No (%)		
Speed limits are mostly unnecessary	Totally agree	58(14.6)	140(35.2)	198(49.7)	1.74(1.1-2.8)	<b>0.02*</b>
	Agree	1(0.3)	2(0.5)	3(0.8)	1.44(0.1-16.3)	0.76
	Disagree	31(7.8)	42(10.6)	73(18.3)	0.98(0.5-1.8)	0.94
	Totally disagree	52(13.1)	72(18.1)	124(31.2)	1	
I like competing in a highway traffic	Totally agree	53(13.3)	131(32.9)	184(46.2)	1.8(1.1-2.9)	<b>0.01*</b>
	Agree	4(1.0)	3(0.8)	7(1.8)	0.5(0.1-2.6)	0.45
	Disagree	30(7.5)	48(12.1)	78(19.6)	1.2(0.6-2.1)	0.55
	Totally disagree	55(13.8)	74(18.6)	129(32.4)	1	
While in a hurry, I can take risks in traffic	Totally agree	55(13.8)	141(35.4)	196(49.2)	2.5(1.5-4.2)	<b>0.00*</b>
	Agree	4(1.0)	6(1.5)	10(2.5)	1.5(0.4-5.5)	0.57
	Disagree	38(9.5)	63(15.8)	101(25.4)	1.6(0.9-2.9)	0.09
	Totally disagree	45(11.3)	46(11.6)	91(22.9)	1	
Driving according to traffic regulation is childish	Totally agree	56(14.1)	139(34.9)	195(49.0)	2.2(1.3-3.6)	<b>0.00*</b>
	Agree	4(1.0)	2(0.5)	6(1.5)	0.4(0.08-2.5)	0.36
	Disagree	32(8.0)	59(14.8)	91(22.9)	1.6(0.9-2.9)	0.08
	Totally disagree	50(12.6)	56(14.1)	106(26.6)	1	
I often drive against traffic rules because others do so as well	Totally agree	56(14.1)	141(35.4)	197(49.5)	2.6(1.6-4.3)	<b>0.00*</b>
	Agree	5(1.3)	3(0.8)	8(2.0)	0.6(0.14-2.8)	0.55
	Disagree	28(7.0)	62(15.6)	90(22.6)	2.3(1.3-4.2)	<b>0.00*</b>
	Totally disagree	53(13.3)	50(12.6)	103(25.9)	1	
If I know the police can't see me, I can take a forbidden shortcut	Totally agree	53(13.3)	123(30.9)	176(44.2)	1.7(1.01-2.8)	<b>0.04*</b>
	Agree	11(2.8)	17(4.3)	28(7.0)	1.13(0.5-2.6)	0.77
	Disagree	37(9.3)	60(15.1)	97(24.4)	1.2(0.6-2.1)	0.55
	Totally disagree	41(10.3)	56(14.1)	97(24.4)	1	
In my opinion traffic offences are punished too severely	Totally agree	45(11.3)	122(30.7)	167(42.0)	2.6(1.5-4.6)	<b>0.00*</b>
	Agree	24(6.0)	50(12.6)	74(18.6)	2.0(1.04-3.9)	<b>0.03*</b>
	Disagree	15(3.8)	45(11.3)	80(20.1)	1.2(0.6-2.3)	0.48
	Totally disagree	35(8.8)	39(9.8)	77(19.3)	1	
I definitely obey the stop sign	Totally disagree	7(1.8)	8(2.0)	15(3.8)	0.6(0.2-1.7)	0.36
	Disagree	5(1.3)	5(1.3)	10(2.5)	0.5(0.15-1.9)	0.33
	Agree	26(6.5)	50(12.6)	76(19.1)	1.03(0.6-1.7)	0.89
	Totally agree	104(26.1)	193(48.5)	297(74.6)	1	
While drive alone, I take risks	Totally agree	54(13.6)	141(35.4)	195(49.0)	1.6(0.9-2.7)	0.06
	Agree	9(2.3)	5(1.3)	14(3.5)	0.3(0.1-1.1)	0.07
	Disagree	41(10.3)	49(12.3)	90(22.6)	0.7(0.4-1.3)	0.31
	Totally disagree	38(9.5)	61(15.3)	99(24.9)	1	
In my opinion, the use of safety belts is unnecessary in urban traffic	Totally agree	48(12.1)	114(28.6)	162(40.7)	1.4(0.9-2.4)	0.13
	Agree	6(1.5)	8(2.0)	14(3.5)	0.8(0.3-2.5)	0.72
	Disagree	40(10.1)	56(14.1)	96(24.1)	0.8(0.5-1.5)	0.59
	Totally disagree	48(12.1)	78(19.6)	126(31.7)	1	
It is easy for me to obey traffic regulations	Totally disagree	6 (1.5)	8(2.0)	14(3.5)	1	0.71
	Disagree	6 (1.5)	6 (1.5)	12(3.0)	0.75(0.15-3.5)	0.88
	Agree	35(8.8)	43(10.8)	78(19.6)	0.9(0.3-2.9)	0.41
	Totally agree	95(23.9)	199(50.0)	294(73.9)	1.5(0.5-4.6)	
After driving against traffic rules, I feel guiltiness	Totally disagree	12(3.0)	34(8.5)	46(11.6)	1.6(0.7-3.1)	0.21
	Disagree	4(1.0)	5(1.3)	9(2.3)	0.7(0.2-2.6)	0.58
	Agree	31(7.8)	44(11.1)	75(18.8)	0.8(0.5-1.3)	0.35
	Totally agree	95(23.9)	173(22.6)	268(67.3)	1	
Drinking a small amount of alcohol just before driving depends on one's ability	Totally agree	55(13.8)	141(35.4)	196(49.2)	1.96(1.2-3.2)	<b>0.00*</b>
	Agree	2(0.5)	3(0.8)	5(1.3)	1.15(0.2-7.1)	0.88
	Disagree	36(6.0)	48(12.1)	84(21.1)	1.02(0.6-1.8)	0.94
	Totally disagree	49(12.3)	64(16.1)	113(28.4)	1	
I try to overtake a car in front of me	Totally agree	49(12.3)	113(28.4)	162(40.7)	1	0.3
	Agree	5(1.3)	1(0.3)	6(1.5)	0.08(0.01-0.8)	<b>0.02*</b>
	Disagree	32(8.0)	41(10.3)	73(18.3)	0.6(0.3-0.98)	<b>0.04*</b>
	Totally disagree	56(14.1)	101(25.4)	157(39.4)	0.8(0.5-1.2)	0.3
I never drive across the yellow line	Totally disagree	14(3.5)	30(7.5)	44(11.1)	1.1(0.5-2.2)	0.72
	Disagree	1(0.3)	5(1.3)	6(1.5)	2.6(0.3-22.9)	0.37
	Agree	32(8.0)	41(10.3)	73(18.3)	0.6(0.4-1.1)	0.14
	Totally agree	95(23.9)	180(45.2)	275(69.1)	1	
Minor traffic violations should be punished only in case of crash	Totally agree	54(13.6)	122(30.7)	176(44.2)	1.35(0.8-2.1)	0.19
	Agree	0(0)	0(0)	0(0)	0.75(0.4-1.3)	0.33
	Disagree	31(7.8)	39(9.8)	70(17.6)	1	
	Totally disagree	57(14.3)	95(23.9)	152(38.2)		

\*Statistically significant (P-value less than 0.05)

ing peer fraud, disobey regulation when no police, wrong perception about offense punishment, alcohol drinking and overtaking in front vehicles) were identified as the correlated variables with the occurred RTC with specific odd ratio (OR), 95% confidence interval (CI) and p-values as explained in table 2 in details. There is statistically significant difference in attitudes of drivers towards those items with the occurrence RTCs. Drivers with negative attitudes/behaviors towards these items were more likely to sustained RTCs.

## Discussion

### Attitude of drivers towards speeding

Among the domain of drivers' attitude towards road traffic safety, speeding perception is a key for the occurrence of RTC [9]. In the present study conducted among a total of 398 public transport drivers, majority of them (49.7%) had very negative attitude (scale 1) about speed limitation that associated with the likelihood of RTC occurrence (about 1.74 times) in comparison to those who had positive attitude/scale 4 (31.2%). Drivers who had competing interest with scale 1 (46.2%) were faced trauma about 1.8 times than others who had not interested to compete/scale 4 (32.4%). The occurrence of RTC was higher (2.5 times) among drivers who take risk in hurry driving (scale 1) than other drivers with scale 4 where all speeding domains shows statistically significant difference among four point Likert scales of DAQ. The present finding of drivers' attitude of speed was in agreement with previous studies [7-10] that revealed negative attitudes (scale 1) were associated with the occurrence of RTC.

### Attitude of drivers towards traffic regulation

The present study revealed that majority of public transport drivers were violated road traffic regulation within the last 12 months at least once while there were fewer drivers who strictly obey and adhere to traffic laws as assessed by items with negative statements. But, there is no significant statistical difference in allocation of drivers among the four Likert scales of items with positive statements in association with the occurrence of RTC. There was a huge difference in distribution of drivers who strictly obeying stop sign/scale 4 (74.6%) and those who violate stop sign (3.8%) with scale 1/totally disagree to this item. But, it was statistically evidenced that the probability of committing RTC was more likely (1.7-2.6 times) among drivers who belong to scale 1 in comparison to those with scale 4 as assessed by items with negative statements towards traffic regulations. This finding was also supported by study of Nabi et al. [7] who reported the higher (2.1-2.6 times) likelihood of occurrence of RTC among who violated the traffic law in 2001-2003 period in French by GAZEL cohort.

In the present study, majority of the drivers (40.7%) had negative attitude and behavior (scale 1) about seat belt but there is no statistically significant difference among other scales expressing level of drivers' attitudes towards seat belt in association with the sustained of RTC/crash opposing the study of Gopaul et al. [11] who reported that about 46.7% of respondents always wore seat belts from which 93% believed strongly (scale 4) and their use was essential for safety probably due to population difference of Jimma and France. But, the present finding revealed the statistical significant difference of drivers' attitude scales towards traf-

fic regulations and its subsequent risk of RTC or sustained road traffic crash. This finding was also supported by studies of Riaz and Shahid [12] and Tajvar et al. [13] who conducted study among drivers in Pakistan and Iran respectively. Additionally, Yahia et al. [14] also reported there is no statistically significant gender difference among drivers' attitude towards RTS in regards to degree of RTC occurrence.

### Attitude of drivers towards alcohol drinking

Majority of the drivers (49.2%) had negative attitude and behavior of drinking and driving who voted for attitude scale 1/very agree and belief in drinking and driving while a few (28.4%) had positive attitude/scale 4/ not drink and drive which also creates statistical significant difference to occurred (about 1.96 times) among two extreme groups (with scale 1 and 4) which was also in line with study of Pal Ulleberg [15] who revealed higher occurrence of RTC among those who had negative attitudes towards drinking and drive (those who drink and drive /scale 1).

### Attitude of drivers towards over taking and close following

The other domain used frequently to assess attitude/behavior of drivers towards RTS is over taking and close following where majority of the drivers (57.7%) in the present study claimed as negative attitude and behavior towards over taking and close following (scale 1 and 2) while a few (42.3%) were allocated to scale 3 and 4 for their perception of positive attitude/behavior towards over taking and close following which also creates statistical significant difference to sustained RTC among scales.

### Association of drivers attitude towards RTS with occurred RTC

About nine items of DAQ variables with negative statements (speed limitation problems, interest of competition, taking risks, perception of obeying regulation as childish, mimicking peer fraud, disobey regulation when no police, wrong perception about offense punishment, alcohol drinking and overtaking in front vehicles) were identified as the correlated variables with the occurred RTC. The occurrence of RTC was more likely among drivers with negative attitude/behavior (scale 1) than those with positive attitude/behavior (scale 4) towards road traffic safety. This finding was also in harmony with study of Gopaul et al [11] that showed that alcohol consumption, use of mobile phones while driving, speed and age were significantly ( $p > 0.001$ ) associated with RTC. In another wing, drivers with positive attitude towards RTS had less probability to sustained RTC and this finding was also supported by study of Mirzaei et al [5] who revealed higher knowledge, safer attitude, and safer practice were associated with a decreased number of RTC. The study of Pal Ulleberg [15] supports the presenting finding in declaring different personality subtypes of young drivers (speeding, rule violation, drinking and driving) and its relationship to risk-taking preferences to crash involvement.

## Conclusion

More than one third of drivers (35.7%) were sustained road traffic crash. DAQ was applied to assess drivers' attitude towards road traffic safety with four domains. There were statistically significant

variations in drivers' attitude towards road traffic safety domains and associated with the occurred road traffic crashes. The occurrence of RTC was more likely among drivers with negative attitudes/behaviors (who agreed/very agreed to items with negative statements and/or who disagreed/very disagreed to items with positive statements) than those drivers with positive attitudes/behaviors (who disagreed/very disagreed to items with positive statements and/or who agreed/very agreed to items with negative statements). Among the assessed 16 items of DAQ, about nine items with negative statements (speed limitation problems, interest of competition, taking risks, perception of obeying regulation as childish, mimicking peer fraud, disobey regulation when no police, attitude about offense punishment, alcohol drinking and overtaking in front vehicles) were determined to had statistically significant associated with the occurred RTCs. Conducting the study only at Jimma zone and involvement of fewer females in the study might be considered as a limitation of the study.

### Availability of Data and Materials

The authors confirm that the data used for study are available within the article and any other required data and materials will also accessed and provided by corresponding author of the study.

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