



Personal and driving related characteristics as predictors of risky driving behavior among drivers in Debre Tabor Town, Northwest Ethiopia: A mixed method study

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ARTICLE INFO

Keywords:

Risky driving behavior
Drivers
Ethiopia

ABSTRACT

Objective: This study aimed to assess the risky driving behavior and associated factors among drivers in Debre Tabor town, Ethiopia, 2020.

Methods: This study was a mixed type community-based cross-sectional survey of 564 and 11 participants for quantitative and qualitative study by using a self-administered questionnaire and an interview method, respectively, and the analysis was carried out in 2021.

Results: Eighty-two-point one percent (82.1%) of drivers were engaged in risky driving behavior. Driving at night, never attending religious events/ceremonies, driving >8 h/day, believing income is insufficient, weak law enforcement, training institutions problem, being Bajaj driver, and being a non-governmental-driver were significantly associated with risky driving behavior.

Conclusion: Risky driving behavior was high among drivers. Being non-governmental driver was the protective factor of risky driving behavior however the rest variables were the risk factors for risky driving behavior. To overcome the problem, appropriate law enforcement measures should be taken.

1. Introduction

Road traffic injuries are a critical but frequently neglected public health problem. According to the World global status report on road safety estimated that 1.35 million people die due to road traffic injury (World Health Organization 2018).

The human behavior is the most common contributing factor in traffic injuries accounts for more than 85% of all traffic injuries (Peden, Scurfield et al. 2004). The causes of road traffic injuries are driver risky behavior, road conditions, and vehicle conditions (Jafarpour and Rahimi-Movaghar 2014, Waseela and Laosee 2015). Driver risky behavior is a crucial factor. Evidences indicated that risky driving behavior accounts for approximately 95% of all RTA. As a result, RTA

has evolved into a sudden human-caused crisis that affects every family (Bazzaz, Zarifian et al. 2015).

If the drivers engaged in any of the risky driving behaviors (driving after consuming alcohol, not wearing a seat belt, driving too fast, and using or receiving a cell phone while driving), may cause a major devastating problem for both developed and developing countries (Sucha, Sramkova et al. 2014). According to various academic reports, the most common risky driving behavior is speeding and unfastened seat belts (World Health Organization 2013, Kakkar, Aggarwal et al. 2014, Rasool, Alekri et al. 2015, Singh, Singh et al. 2016). Approximately 30% of the dead drivers were driving with alcohol in their blood, and the risk of injury increases significantly as the excessive blood-alcohol limit rises (Aavik 2010).

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<https://doi.org/10.1016/j.ijans.2023.100591>

Received 21 October 2022; Received in revised form 17 July 2023; Accepted 23 July 2023

Available online 24 July 2023

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According to the Ethiopian national road safety council report, risky driving behavior has a substantial impact on RTA, accounting for 81% of all crashes (Gebremichael, Guta et al. 2017). Speeding and failing to give pedestrians priority were the leading causes of fatal and non-fatal crashes in Ethiopia, accounting for 44.80 % and 45.89 % respectively (Tulu, Washington et al. 2013). As a result, the aim of this study was to investigate the risky driving behavior in Debre Tabor, Ethiopia.

2. Methods and materials

2.1. Study period and area

The study was conducted at Debre Tabor town from November 30 to December 30/2020. Debre Tabor is the capital city of the south Gondar

zone and located 666 and 103 km away from Addis Ababa and Bahir Dar respectively.

2.2. Study design and study population

A community-based cross-sectional mixed-method study was conducted. All drivers in Debre Tabor town were the source population and all licensed drivers were the study population.

2.3. Sample size determination and sampling procedure

The sample size was calculated using a single population proportion formula, by considering the following assumptions; Confidence level (CL) 95%, 5% margin of error, and p = 66.6% (Hassen, Godesso et al.

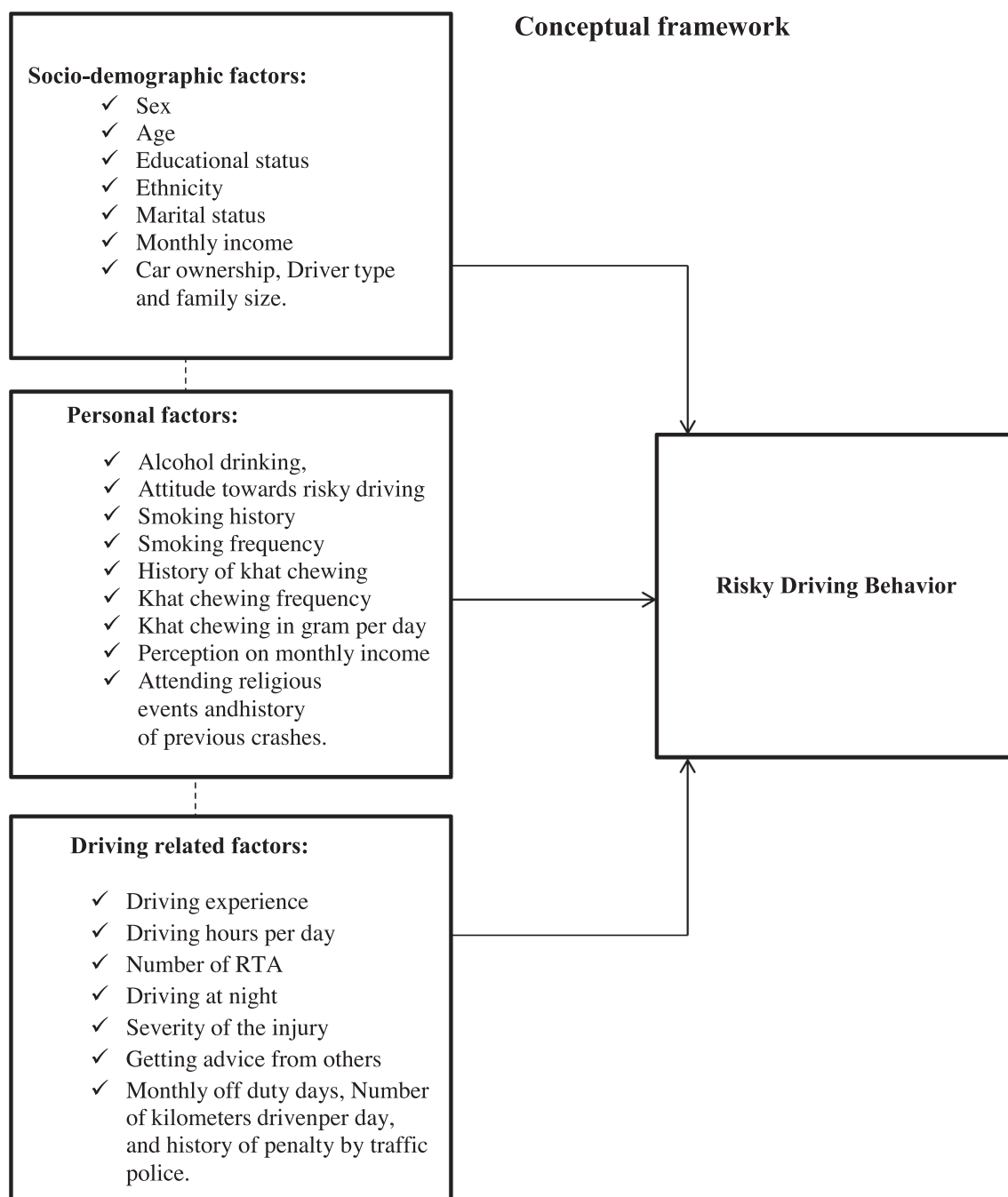


Fig. 1. Personal and Driving Related Characteristics as predictors of Risky Driving behavior among Drivers in Debre Tabor Town, 2023.

2011) with $n = ((z\alpha/2)^2 P(1-P)) / d^2$ formula yields 376 considering 10% non-response rate. To increase the representativeness, 50% of the calculated sample was added, and the final sample size became 564. Participants were selected through a simple random sampling technique. Eleven (11) purposively selected interviewees were undertaken for the qualitative study.

2.4. Variables of the study

Risky driving behavior was the dependent variable.

Socio-demographic factors: sex, age, educational status, ethnicity, marital status, monthly income, car ownership, driver type, and family size.

Driving related factors: driving experience, driving hours per day, number of RTA, driving at night, severity of the injury, getting advice from others, monthly off duty days, number of kilometers driven per day, and history of penalty by traffic police.

Personal factors: alcohol drinking, attitude towards risky driving, smoking history, smoking frequency, history of khat chewing, khat chewing frequency, khat chewing in gram per day, perception on monthly income, attending religious events, and history of previous crashes were the independent variables, (Fig. 1).

2.5. Data collection tool and procedure

A modified semi structured questionnaire was used to collect the data in a face-to-face interview (Mekonnen, Tesfaye et al. 2019). The questionnaire comprises four sections: (I) socio-demographic characteristics, (II) driving related characteristics, (III) personal related factors, and (IV) risky driving behavior with four-point likert scale measuring items ranging from (always = 3, often = 2, sometimes = 1, and never = 0). For further analysis the four-point Likert scale was dichotomized into having risky driving behavior = 1 (always, often, sometimes) and not having risky driving behavior = 0 (never). For the qualitative study, data were collected using unstructured questions with in-depth interview. Using Cronbach's Alpha (α), the internal consistency of the risky driving behavior measurement items was examined and 0.90 was the Cronbach's alpha value.

For three-wheeled vehicle drivers, data were collected when they were coming to their association office to receive their weekly rotation on Sunday and data collection on governmental institution employed drivers and organizational drivers were on their working institution. The data collection for public transport drivers was at the bus station. For automobile drivers, the data was collected on their residential houses based on personal data obtained from the town road transport office. Face to face interviewer based questionnaire was used and the task was handled by the data collectors. The time for the data collection was around 20 min.

The qualitative data were collected by using an in-depth interview for drivers and key informant who working in traffic rule enforcement to deeply investigate why drivers engaged in risky driving using an interview guide questionnaire. The in depth interview was carried out by the principal investigator and with note taker. The interview was conducted in their corresponding working places with quiet and relaxed environment. The time taken for in-depth interview was from 45 min to 60 min.

2.6. Data quality assurance

Data quality was assured through conducting training for data collectors. The daily evaluation was carried out to address any issues that arose during the data collection process.

2.7. Operational definitions/definition of terms

Risky driving behavior: Those who have engaged in any one of the six risky driving behavior, (speeding, drinking and driving, driving

when sleepy, not wearing a seat belt, using or receiving a phone call while driving, and highway code violation) (Hassen, Godesso et al. 2011, Mekonnen, Tesfaye et al. 2019).

Speeding: driving above the speed limit, and too fast for the conditions.

Using mobile phone while driving: Using cell phones for receiving or calling while driving.

Not wearing a seat belt: Never to use a seat belt while driving.

Driving when sleepy: Drive while becoming tired or sleepy.

Highway code violation: participants have experienced any one of the following; change lanes or turn without using side mirrors, change lanes without signaling to get ahead of other vehicles, drive too close to other vehicles, overtake without a clear view and from the right hand lane, cross pedestrian line while the pedestrian waiting to cross, and deliberately going through red lights (Mekonnen, Tesfaye et al. 2019).

Drink-drive: Driver who drives after consuming one or more alcoholic beverages within three hours (Hussen, Hashi et al.).

2.8. Data processing and analysis

Data was cleaned before being coded and entered into Epi-data version 4.6.0.2 statistical software, and then exported to SPSS Version 23 for analysis conducted in 2021. Binary logistic regression analysis and thematic content analysis was used for quantitative and qualitative data respectively.

2.9. Trustworthiness of the study

To ensure the study's validity, we considered the following areas: dependability, conformability, credibility, and transferability (Guba and Lincoln 1982). The triangulation of various components of data gathering ensured the data acquired in this study was trustworthy: (A) incorporating different drivers, (B) Researchers with relevant experience were invited to participate and the research findings were determined to be trustworthy.

2.10. Anonymity and confidentiality

The anonymity and confidentiality of the participants was preserved through not revealing their names and identity at the stage data collection, analysis and reporting of the study findings. Privacy and confidentiality of the interview environment was managed carefully during discussion, interview session, and data analysis.

3. Results

3.1. Socio demographic characteristics of the participants

Out of 564 respondents, a total of 543 (96.3%) drivers were participated in the study. Out of these, 511 (94.1%) of the respondents were male. Three hundred seventy-four (68.9%) of the respondents were in the age group of less than or equal to 29 years, (Table 1).

A total of 11 in-depth interviews were conducted as part of the qualitative research. Seven of them were drivers, while the others were traffic police and volunteers enforcing traffic laws. In terms of education, four of the participants had a BSc degree and four had a diploma. Eight of the participants had more than two years of work experience. After the interview, the respondent's ideas were transcribed, translated, coded, and categorized into two themes. These themes were risky driving behavior (subtheme: common risky driving behavior), and Reasons for risky driving behavior (subthemes: the socio-economical problem, institutional problem, less strict in law enforcement, poor in faith, and being young in age).

Table 1

Socio-demographic characteristics of the drivers in Debre Tabor town, Northwest, Ethiopia (n = 543).

Variables Category	Frequency	Percent	
Sex	Male	511	94.1%
	Female	32	5.9%
Age	<=29	374	68.9%
	>=30	169	31.1%
Marital Status	Single	337	62%
	Married	154	28.4%
	Divorce	20	3.7%
	Widowed	32	5.9%
Education status	Primary school	306	56.4%
	Secondary school	127	23.4%
	Above secondary	110	20.2%
Ethnicity	Amhara	453	83.4%
	Tigre	60	11.1%
	Others	30	5.5%
Average monthly income	<2000 Ethiopian birr	250	46%
	>=2000 Ethiopian birr	293	54%
driver type	Code-1	367	67.6%
	Code-2	10	1.8%
	Code-3	96	17.7%
	Code-4	55	10.1%
	Code-5,35and 42	15	2.8%
Ownership of car	Yes	248	45.7%
	No	295	54.3%
Family size	<=3	291	53.6%
	>=4	252	46.4%

Other: Kimant, Oromo, code -1: Baja (three wheeled); code -2: Automobile; code -3: Public transport and other business; code -4: Governmental drivers; code -5: Local non-governmental organizations (NGO); code 35 and42: International NGO agencies.

3.2. Driving related characteristics of the respondents

Regarding the driving exposure characteristics of the respondents, four hundred fifty-five (83.8%) of them had driving experience of less than two years and 364 (67%) of the respondents had driven greater

Table 2

Driving related characteristics of drivers in Debre Tabor town, Northwest, Ethiopia (n = 543).

Variables Category	Frequency	Percent	
Driving experience	<2 years	455	83.8%
	>=2years	88	16.2%
Driving hour/day	<4	53	9.8%
	4-8	126	23.2%
	>8	364	67%
Number of RTA	<3	55	79.7%
	>=3	14	20.3%
Severity of the injury	Yes	23	33.3%
	No	46	66.7%
Driving at night	Yes	422	77.7%
	No	121	22.3%
History of penalty by traffic police	Yes	177	32.6%
	No	366	67.4%
Kilometer driven/day	<100 km	141	26%
	100-129 km	85	15.7%
	130-159 km	60	11%
	160-189 km	36	6.6%
	190-219 km	44	8.1%
	220-249 km	42	7.7%
	250-279 km	25	4.6%
>=280 km	110	20.3%	
Getting advice from others	Yes	79	14.5%
	No	464	85.5%
Monthly off duty days	< 1 day	250	46%
	1-2 days	89	16.4%
	3-4 days	114	21%
	5-6 days	40	7.4%
	7-8 days	23	4.2%
	>=9days	27	5%

than 8 h/day, (Table 2).

3.3. Personal related characteristics of the respondents

Two hundred nineteen (40.3%) respondents had a history of smoking and 100 (45.7%) of the respondents were smoke cigarettes every day. Four hundred twenty respondents (77.5%) had unsupportive attitudes towards risky driving, and 280 (51.6%) of the respondents had reported that they never attend a religious ceremony, (Table 3).

3.4. Risky driving behavior

After the summation of the four Likert scale outcome variable measuring items, the proportion of the drivers' risky driving behavior was 82.1%, (95 %CI; 78-85.3), (Fig. 2). More than half of the participants 310 (69.5%) had reported that they drive over the speed limit and 80 (17.9%) respondents had been driving after alcohol consumption. Eighty (17.9%) of drivers with seat belts had driven without using a seat belt, and 187(41.6%) of respondents were engaged in high code violations, (Table 4).

Furthermore, the qualitative study discovered that risky driving behavior among drivers was the most critical problem. A male driver in his 39 s suggested that:

“...extremely risky driving behavior is especially common in zone cities and suburbs” (participant-7).

A volunteer traffic police officer in his 24 s also stated:

“Traffic laws have not been implemented in Debre Tabor town. They stay up all night through drinking jumbo. This is in desperate need of improvement” (participant-8).

The problem of risky driving behavior was varied across types of drivers. Especially business drivers were more engaged in risky driving behavior than organizational drivers. A traffic police in his 24 s had made the following remark:

Table 3

Personal related characteristics of drivers in Debre Tabor town, Ethiopia (n = 543).

Variables	Category	Frequency	Percent
Alcohol drinking	Yes	463	85.3%
	No	80	14.7%
Smoking history	Yes	219	40.3%
	No	324	59.7%
Smoking frequency	Daily	100	45.7%
	1-3 days/week	71	32.7%
	Sometimes	48	21.9%
History of khat chewing	Yes	338	62.2%
	No	205	37.8%
Khat chewing frequency	1-2 days/month	69	20.4%
	Once per week	53	15.7%
	1-3 days per week	53	15.7%
Chewing in gram/day	Daily	163	48.2%
	<300 g	110	32.5%
	300-500 g	94	27.8%
Think monthly income is enough	>500 g	134	39.7%
	Yes	110	20.3%
Frequency-of-attending religious events/ceremony	No	433	79.7%
	Daily	86	15.8%
Attitude-towards-risky driving	Every week	64	11.8%
	Every month	46	8.5%
	Once per year	67	12.3%
	Never	280	51.6%
	Supportive	122	22.5%
Unsupportive	420	77.5%	

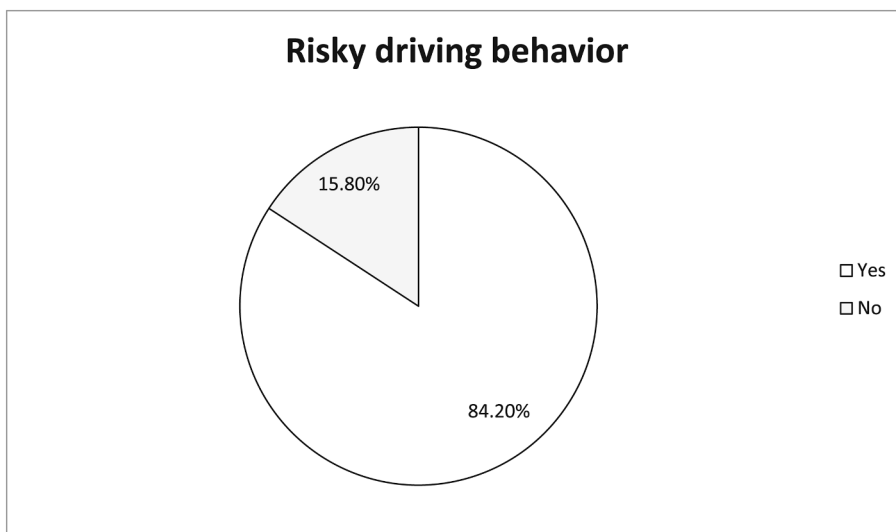


Fig. 2. Risky driving behavior among Debre Tabor town drivers Northwest, Ethiopia, 2020.

Table 4

Frequency distribution of risky driving behaviors among drivers in Debre Tabor town, Ethiopia (n = 543).

Risky driving behaviors	Frequency	Percent
Above the speed limit	310	69.5%
Using mobile phone while driving	284	63.7%
Not wearing a seat belt	80	17.9%
Driving when sleepy	164	36.8%
High code violation	187	41.6%
Drink and drive	80	17.9%

“Even if they complete the training, it is apparent that most drivers have performance issues. As a result, it varies depending on the drivers, particularly business drivers, who engage in risky driving behavior” (participant-3).

The most commonly stated risky driving behavior of the drivers were speeding, drinking and driving, running red lights, not giving pedestrians priority, and disregarding traffic signs.

A traffic police in his 29 s said that:

“The majority of drivers are seen driving quickly in order to make more money” (participant-1).

A male driver in his 39 s also add more:

“There are so many risky driving behavior, among drivers especially driving fast is the major problem” (participant-7).

Furthermore, a male driver in his 32 s stated:

“In my perspective, breaking red lights, not giving pedestrians priority, and disobeying traffic signs all are observed”(participant-5).

4. Factors associated with risky driving behavior

In the bivariable logistic regression analysis; from sociodemographic variables sex, monthly income, educational status, driver type, ethnicity, ownership of the car, and family size had p- value < 0.25. Similarly, variables from personal related characteristics like frequency of attending a religious ceremony/event, attitude towards risky driving, history of smoking, and perception towards income had p- value < 0.25. In addition, variables from driving related characteristics like driving at night, driving hours per day, driving kilometers/day, history of previous crash, and history of penalty by traffic police had a p-value of <0.25. In

the multivariable logistic analysis, the odds of risky driving behavior among drivers who drive greater than 8 h/day were 4.3 times higher as compared to driving less than 4 h/day (AOR = 4.30, 95 %CI; 1.43–13.00). The odds of risky driving behavior among drivers who drive at night were 3.7 times higher as compared to its counterparts (AOR = 3.70, 95 %CI; 1.60–8.40). On the other hand, the odds of having risky driving behavior among NGO drivers were decreased by 85.3% as compared with three-wheeled (Bajaj) drivers (AOR = 0.15, 95 %CI; 0.03–0.66). Regarding the frequency of attending religious ceremony/ events; Drivers who never attending religious organization ceremony /events were 5.6 times more likely to have risky driving behavior than those who attended daily (AOR = 5.60, 95 %CI; 1.90, 16.40) and moreover drivers who perceive their income is insufficient were 8 times more likely to have risky driving behavior than those who did not think their monthly income is enough (AOR = 8.00, 95 %CI; 3.60–18.50), (Table 5).

In addition, the qualitative analysis found a number of factors linked to risk driving behavior; economic concerns, insufficient law enforcement, weak in faith, institutional related challenges, and being young in age. A male driver in his 32 s stated:

“Money-hungry people are careless about others and don’t think about the future” (participant-5).

A male driver in his 19 s was also given the following points:

“As a Bajaj(three-wheeled) driver, I get 3 Birr per trip for three people, so I don’t make enough money if I don’t travel quickly” (Participant-4).

Participants also stated that traffic rules and regulations were not followed correctly. A male traffic police in his 30 s explained that:

“We’re having trouble enforcing the law. For example, the law states that if a driver loses three times and is not corrected, he or she will be fired. Drivers want to hurt us if we punish them” (participant-10).

In addition, a male driver in his 39 s stated:

“Due to current political instability the traffic laws are not implemented. Unless the people live by the moral law, the legal law is not implemented” (participant-7).

Participants suggested that weak in faith was also the main reason for risk driving behavior. A male driver in his 39 s stated that:

“Weaknesses in a person’s beliefs can lead to risky driving behavior as well as other risky behaviors” (participant 2).

Table 5
Multivariable logistic regression analysis of risky driving behavior among drivers in Debre Tabor Town, Northwest, Ethiopia (n = 543).

Variables Category		Risky driving		COR (95 %CI)	AOR (95 % CI)
		No (N)	Yes (N)		
driver type	Bajaj drivers	52	315	1	1
	Automobile drivers	9	1	0.02 (0.00,0.15)	0.10 ((0.01,1.16)
	Public transport drivers	15	81	0.89 (0.48,1.66)	0.43(0.149, 1.26)
	Governmental drivers	11	44	0.66 (0.32,1.36)	1.33 (0.45,3.87)
	NGO drivers	10	5	0.08 (0.03,0.25)	0.15 (0.03,0.66) *
Sufficient Income	Yes	72	38	1	1
	No	25	408	30.90 (17.60,54.32)	8.00 (3.60,18.50) **
Drive at night	No	56	65	1	1
	Yes	41	381	8.00 (4.90,12.90)	3.70(1.60, 8.40) *
Frequency of attend religious events/ ceremony	Daily	46	40	1	1
	Weekly	12	52	4.98 (2.30,10.60)	2.90 (0.83,10.30)
	Monthly	17	29	1.96 (0.94,4.09)	0.78(0.25, 2.41)
	Once/year	8	59	8.48(4.50, 33.85)	3.00 (0.80,10.90)
	Never	14	266	21.85 (11.02,43.32)	5.60 (1.90,16.40) *
Working Hrs./day	<4Hr	22	32	1	1
	4-8Hr	55	71	0.85 (0.44,1.63)	0.69(0.24, 2.00)
	>8Hr	21	343	10.72 (5.30,21.69)	4.30 (1.43,13.00) **

AOR: adjusted odd ration; COR: crude odd ration.

*=significant with p-value < 0.005, ** significant with p-value < 0.001, 1 = reference.

The other most frequently explained reason for risky driving behavior was the malpractice of training institutions. A female driver in her 24 s expressed her view like this:

“Some trainers in training institutions are dishonest. They are crooked robbers” (participant-6).

Similarly, a traffic police had made remark like this:

“.... These institutions are killing people. A trainee who has not been properly trained is buying a driver’s license as a commodity with recklessness and greed” (participant-9).

Participants also explored the fact that being young in age was another reason for risky driving behavior. A traffic officer in his 30 s stated:

“I believe that being young is the cause of risky driving behavior because, they have a tendency to look at each other and do bad things” (Participant-10).

5. Discussion

The purpose of this study was aimed to assess risky driving behaviors and contributing factors among drivers in Debre Tabor. The findings of this study revealed that the prevalence of risky driving behaviors was 82.1 % (95% CI) (78–85.3). This result was in line with the findings of a study conducted in Bahir Dar (79.4%) (Mekonnen, Tesfaye et al. 2019).

The prevalence of risky driving behavior in this study was higher

than the studies conducted in Mekele (66%) (Hassen, Godesso et al. 2011), Jakarta of Indonesia (51.5%) (Ratri A. Benedictus 2016), Portugal (50%) (Duarte and Mouro 2019), United Kingdom (13.6%) (Sheriff, Forbes et al. 2015), Saudi (62%) (Hassan 2016), and Tehran (53%) (Adl et al., 2014). The exclusion of novice drivers or beginners in the current study, economic differences, and variations in traffic rule enforcement among countries might be factors (Kakkar, Aggarwal et al. 2014, Rasool, Alekri et al. 2015, Singh, Singh et al. 2016). However, the finding of our study was lower than the finding from Greece (91.2%) (Kritsotakis, Papadakaki et al. 2019). This might be due to age difference. A study in Greece mainly focuses on young drivers’ age between 18 and 20 years. According to studies, young drivers are more likely than other age groups to engage in risky behaviors and cause traffic injuries (Beenstock and Gafni 2000).

The quantitative finding of this study showed that NGO drivers had less risky driving behavior than Bajaj drivers. Similarly, the qualitative finding also revealed that risky driving behavior was most common among Bajaj and other business drivers. The results could be explained by the fact that NGO drivers do not work for profit, whereas Bajaj drivers do. Probable reason is that most Bajaj drivers are young in age, and thus are more likely than other age groups to engage in risky driving behavior and cause traffic injuries.

The other factor associated with risky driving behavior was driving at night; drivers who were driving at night had more risky driving behavior than drivers who were not driving at night. This finding was supported by the qualitative study. Participants explored that especially risky driving behavior was high at night. This finding is also supported with a study conducted in Taiwan (Tseng 2013). This might be due to traffic conditions and less chance to be caught by the traffic police at night.

This finding also demonstrated that respondents who drive greater than 8 h per day had more risky driving behavior as compared to drive less than 4 h per day. This finding is supported by studies conducted in Isfahan city of Iran, Vietnam and two studies of China (Ba, Zhou et al. 2018, Mardani and Pirzadeh 2018, Razmara, Aghamolaei et al. 2018, Nguyen-Phuoc, Oviedo-Trespalcios et al. 2020). This might be due to drivers driving a prolonged hours per day does not get adequate rest, and they became fatigued.

On the other hand, drivers who never attend the religious events/ ceremonies also had more risky driving behavior than those drivers who attend religious ceremonies daily. Similarly, the qualitative finding also explored that being spiritually not wellbeing was a frequently mentioned reason for risky driving behavior. Drivers who are spiritually healthy may practice healthy behaviors like avoiding consuming alcoholic drinks substances, obey the rules and regulations, and give priority to the passengers (Arnold 2011, Mojahed 2014).

In addition, drivers who think their income insufficient were more likely to involve in risky driving behavior. This result supported by the qualitative finding, and explored that perceiving their income insufficient was the reason for their risky driving behavior. This finding is supported by a study done in Vietnam (Nguyen-Phuoc, Oviedo-Trespalcios et al. 2020). The reason might be due to a strong desire to get more money through driving fast.

Another reason for risky driving behavior which was not addressed by quantitative study but explored by the qualitative part of this study was weak law enforcement. The report showed that the main reason for risky driving behavior was due to drivers more likely to engage in risky driving behaviors if traffic restrictions are poorly implemented. This finding is supported by studies conducted in Iran and Scotland (Shams, Shojaeizadeh et al. 2011, Orr, Le Masurier et al. 2013). It is also supported by studies conducted in India, Bahrain, and Ujjain city (Kakkar, Aggarwal et al. 2014, Rasool, Alekri et al. 2015, Singh, Singh et al. 2016). The other most frequently explored idea about the reason for risky driving behavior was the malpractice of training institutions (giving a fake driving license without adequate training). This finding is supported by study conducted in Iran (Shams, Shojaeizadeh et al. 2011).

This might be due to the weakness of the government on monitoring and evaluating the training institutions.

Lastly, young drivers were practiced risky driving behavior more than older age drives. This finding is supported with studies conducted in the UK, Portugal and China (Sheriff, Forbes et al. 2015, Duarte and Mouro 2019, Xiao 2020). This might be due to the impatient and offended behavior of younger drivers leads to engage in risky driving behavior and cause traffic injuries than other age groups (Beenstock and Gafni 2000).

6. Strength of the study

The main strength of the study was utilization of both qualitative and quantitative data (mixed method).

7. Limitation of the study

Throughout the study, respondents were assured complete anonymity and confidentiality, which is critical for reducing social desirability bias. However, a social desirability and recall bias may exist. In addition it's difficult to see a temporal association because we used a cross-sectional research approach.

8. Conclusion

In this study the risky driving behavior of the respondents was significantly high. Being NGO driver was the protective factor for risky driving behavior. In other word being NGO driver decreases the engagement in risky driving behavior which lowers road traffic accident. However, never attending religious organization, driving more than 8 h/day, think income is insufficient, drive at night were the risk factor for having risky driving. Therefore, drivers should respect and strictly follow the traffic rules and regulations, and also the governmental responsible body should take proper law enforcement. In addition, training institutions should conduct adequate and proper trainings for their trainees.

9. Authors Statement

MC, TA and AB worked on the conception of the research idea, designing the study, involved in proposal writing, analyzed and interpreting the results and preparing the manuscript. DK, BM, GA, ZM, NK, DM, YA and AW played their role in critically revising the proposal, participated in its design, analyzed and interpreting the results and wrote the manuscript, training & supervising the data collectors, all authors involved in editing and approving the final manuscript.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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