ADDIS ABABA UNIVERSITY
COLLEGE OF HEALTH SCIENCES
SCHOOL OF PUBLIC HEALTH

PREVALENCE AND FACTORS ASSOCIATED WITH ROAD TRAFFIC ACCIDENT AMONG DRIVERS OF ADAMA TOWN, OROMIA REGIONAL STATE, ETHIOPIA

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Full title of the research project	Prevalence and factors associated with road traffic accident among drivers in Adama Town, Oromia Regional State, Ethiopia
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Declaration

I, Addis Wordofa declare that this thesis is my original work and has never been presented in this or any other university, and that all resources and materials used herein, have been duly acknowledged.

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Acronyms

AAU - Addis Ababa University

AIDS - Acquired Immune Deficiency Disease

AOR - Adjusted Odds Ratio

ARC - African Road Safety Congress

COR - Crude Odds Ratio

CSA - Central Statistical Agency

FTA - Federal Transport Authority

GRSP - Global Road Safety Partnership

HIV - Human Immune Deficiency Virus

IRC - Institutional Review Committee

RTA - Road Traffic Accident

SPSS - Statistical Package for Social Scientists

TB - Tuberculosis

TRL - Total Research Laboratory

USA - United States of America

WHO - World Health Organization

Abstract

Background:-Worldwide, an estimated 1.3 million people die of road traffic accident each year and as many as 50 million get injured. Current and projected trends in motorization indicated that the problem of road traffic accidents will get worse, leading to a global public health crisis. Ethiopia is one of the countries hard hit by Road Traffic Accidents; however, there is limited scientific evidence on magnitude of the problem in certain areas of the nation.

Objectives:- To assess the burden of Road Traffic Accident and its determinants among drivers of Adama Town, Oromia Regional State, Ethiopia, February, 2015.

Methods: - A cross-sectional study design with a stratified sampling with proportional allocation of samples was used in selecting the study subjects. A total of 374 respondents: 22 Taxi drivers, 128 Private car or Automobile drivers and 224 Bajaj drivers were selected by systematic random sampling technique. A face-to-face interview was used and the data were cleaned, coded and entered in to a computer SPSS version 21 model for analysis. Logistic regression was used to assess the association between the study variables at a statistical significance level of ($p<0.05$).

Result:-The magnitude of road traffic accident among drivers during the 12 months period was 211(56.4%). The three major perceived causes of the most recent road traffic accident among the drivers were; 54(25.6%) problems related to the road, 49(23.2%) problems related with the drivers and 48 (22.7%) related with the vehicle. Three fourth (76.2%) of the drivers practiced at least one of the risky driving behavior in the last 12 months. Where, 32(8.5% of the drivers self-reported habit of drinking alcohol, 40(26.7%) reported habit of driving without fastening seat belt, 210(55.1%) reported communication with mobile phone while driving, and 125(33.4%) drove with a speed of > 35 km/hour in the town. On multi variable analysis drivers who had risky driving behavior, drivers who were accused by traffic police man and taxi drivers had more risk of road traffic accident than their counter parts with (AOR= 8.34, 95%CI: 4.34-16.01), (AOR = 6.55, 95%CI: 3.60-11.92), and (AOR= 4.36, 95%CI: 1.01-16.38) respectively.

Conclusion and Recommendation:-The magnitude of road traffic accident was very high. Risky driving behavior was one of the independent predictor of road traffic accident among the study subjects in Adama town. The main reasons to the most recent accidents were related to human errors. Adama town transport authority should develop strategy to improve the understanding of the community on safe use roads, improve the quality of the roads and educate the drivers in the town about the effects of risky driving behavior.

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1. Introduction

1.1. Background

Road traffic accidents (RTA) can be a defined as an accident that occurred on a way or street open to public traffic that results in one or more persons being killed or injured and at least one moving vehicle was involved. Thus, RTA is collisions between vehicles; between vehicles and pedestrians; between vehicles and animals; or between vehicles and geographical or architectural obstacles (1).

Road accident is said to be one of the major international public health concern. Every death on our roads is a major tragedy causing enormous emotional pain and grief to family and friends. The burden of road accidents causalities and damage is much higher in developing countries than developed nations. According to both the World Bank and the World Health Organization (WHO) independent studies have reported that, worldwide, there are around 500,000 fatalities and 15 million injuries per annum as a result of road accidents globally. Earlier estimates also suggest that about sixty percent of these deaths and injuries take place in those countries of Africa and Asia which are classified by the World Bank as low or middle income countries (2, 3). Pedestrians and passengers of commercial vehicles are the most vulnerable in Ethiopia, whereas in high-income countries crashes involve primarily privately owned vehicles with the driver being the main car occupant injured or killed. However, in the United States of America (USA), for instance, 60% of the fatalities account to car drivers, while in Ethiopia, 5% account to drivers. This implies that in one crash the number of people killed or injured in Ethiopia is about 30 times higher than in the USA (4, 5, 6).

In Africa, Ethiopia is second highest, next to the Central African Republic, having 195.1 traffic accidents per 10,000 vehicles. The prevalence of an extremely alarming number of RTA has created large negative socio-economic costs in actual and opportunity costs. The situation is likely to be even more severe than shown in the statistics due to the possibility of under-reporting. Not only are these rates high, with the average vehicle evidently having a more than 10 percent chance of accident involvement each year, but they appear to be also rising faster than

the growth of the vehicle fleet (6). The same study shows the reasons for this situation include poor driving standards, ineffective enforcement of driving regulations, poor condition of vehicles, and inadequate road design. Pedestrian fatalities are high, partly because adequate sidewalks are often absent like many developing countries; the vehicle fleet in Ethiopia generally consists of very old vehicles and without adequate maintenance. Although there is no detailed factual data to substantiate the age of the national vehicle fleet, some information obtained from the Federal Transport Authority indicate, on average vehicles being imported to the country are 20 or more years old and the age of most of the national vehicle fleet is believed to be 30 or more years (4,5,6). The recommended National Road Safety Council has yet to be set up in Road safety improvements can be achieved with in the three components of the road safety system that includes changes in infrastructure design (which includes road and road signs), vehicle safety, and road user behavior (driver, pedestrian, passengers) (1, 6, 7).

Evidences on the Risk factors for RTA reported from various countries in Africa (Kenya, Uganda, Ethiopia, Tanzania, Ghana, South Africa, and Zimbabwe) show that most of road crashes are largely due to a range of human error, road and vehicles factors that include over speeding, risky overtaking, alcohol and drug abuse, driver negligence, poor driving standards, vehicle overload, poor maintenance of vehicles, bad roads and hilly terrain, negligence of pedestrians; distraction of drivers (e.g. speaking on cell phones) (6, 8).

1.2. Statement of the problem

An estimated 1.3million people die in road traffic accident each year and as many as 50 million are being injured (3, 9). Current and projected trends in motorization indicated that the problem of RTAs will get worse, leading to a global public health crisis. It has been indicated that by 2020 RTA is expected to be the third major killer after HIV/AIDS and TB (4, 5,10). RTA in Ethiopia was among the highest accident records in the world as presented per 10,000 vehicles. Circumstance like road transport is the major transportation mechanism in Ethiopia along with poor road structure, poor enforcement of traffic law and other factors could attribute this higher level of RTA. Great proportions of the road accidents are concentrated in Addis Ababa city which is the capital city of Ethiopia and Oromia region that accounted 58% of all fatalities and two-third of all injuries. According to federal police commission report the death rate due to car

accident is significantly increasing among pedestrians and passengers from time to time in Ethiopia. A total of 25,110 accidents and 3,415 fatalities were recorded in Addis Ababa during 2000-2009. The majority of fatalities 2970 (87%) were pedestrian, followed by passengers 297(9%) and drivers 148 (4%). A global status report on road safety by WHO, indicated in Ethiopia; there were 2517 fatalities in 2006 and 24,792 non-fatal road traffic injuries in 2007 (6, 11, 12, 13). A report from traffic Police office of Adama town (the study area) indicated that in 2013, there were a total 243 RTA with 39 deaths, 78 serious injuries and 126 mild injuries with worsening of the situation from year to year especially with increasing motorization. Concurrently, the report showed that 96% of the causes were related to human risk behavior whereas 4% was due to vehicle problem *(*14*).*

Evidences noted that human behavior is the most common factor accounting for more than 85% of all traffic accidents (15). Studies has indicated that an increase of 1 km/h in mean traffic driving speed results in a 3% increase in the incidence of accident crashes and a 4 to 5% increase in fatal crashes (16, 17, 18). Another risky behavior identified for road traffic accident is taking alcohol and driving, not using seat belts, and taking through mobile phones while driving (19, 20, 21, 22, 23, 24, 25). Knowledge, belief, attitude on risky driving behaviors and driving experience were also important aspects of risky behaviors identified with evidences (26, 27, 28, 29). A recent study in Mekele Town, Ethiopia indicated (42.3%) of drivers were using mobile phone while driving vehicles, (62.6%) of house car and (37.4%) of taxi drivers unfasten their seat belt while driving (30). Despite its devastating consequences and the negative socio-economic costs the reality on the ground disclose an overbearing state of risky driving behavior among drivers in major cities in Ethiopia. During the period of 2004/05 to 2013/14, the trend of fatalities, injuries and property damage due to RTA in Adama city showed an increasing pattern. Among 1949 spatially distributed RTA that were documented; 264 were death, 283 were serious injuries, 359 slight injuries and 1043 were property damage (31). Despite the worsened increase in the burden of RTA in Adama town in recent years, the contribution of driver, road, and vehicle related factors in general and the situation of risky driver behavior in particular are not well understood. Therefore, this study was conducted with the intension to assess the magnitude of RTA and level of risky driving behavior among Taxi, Bajaj and Automobile drivers in Adama town.

1.3. Significance of the study

Evidences noted that human behavior accounts the lion share among the factor resulting traffic accidents. Among the risky human behaviors is driving over the recommended principles and personal behaviors which could be potentially modified through designing contextually appropriate interventions that targets locally specific behaviors. The significance of this research therefore, lays in its development of new insights related to road traffic accidents and risky driving behaviors in the context of Adama town where the main transportations mechanism and vehicle drivers with in the town were specifically considered. Considering the size of the accident data set, applying data mining techniques to model RTA data records can help to reveal how the drivers' behavior and road way and pedestrian conditions are causally connected with different road traffic injuries. It mainly provides valuable input and contribution for developing appropriate interventions that could improve road safety and risk reduction through suggesting prominent driver related characteristics and targets. Therefore, it can help decision makers to formulate better traffic safety control policies, label roads with necessary signs informing drivers and pedestrians of accident risks, and design better roads. The study result also serves as a source of data for further investigation of related to problem pic in the future.

2. Literature review

2.1. Extent of road traffic accidents Global View

According World Health Report 2012 on Africa Brief Future shows that of the 1.3 million people killed in road crash worldwide, 85% are in developing countries. This reveals a serious and growing problem, with absolute fatality and casualty figures rising rapidly in the majority of developing countries and with death rates considerably higher than in the developed world (8, 11).

The report of WHO 2004 reported that every day thousands of people are killed and injured on our roads. Men, women and children walking, biking, or riding to school or work, playing in the streets or setting out on long trips, will never return home, leaving behind shattered families and communities. Millions of people each year will spend long weeks in hospital after severe crashes and many will never be able to live, work or play as they used to do) (6, 11).The same report has ranked road traffic accident (RTA) the worldwide leading causes of death by age as follows) 15-29 year olds (1st), 5-14 year olds (2nd), 30-44 year olds (3rd), 45-69 year olds (8^{th}), and 70 +year olds (20th). These data suggest that globally, among5-29 year olds, the leading cause of death is traffic accidents (6).

According to the 2013 WHO Global Status Report on Road Safety, strategies already exist in many countries to reduce the number of fatalities and injuries due to road traffic accidents. Measures adopted include compulsory seatbelt use, drink-driving laws, and speed limits; particularly in residential and commercial areas the number of deaths related to road traffic accidents has remained stubbornly high. Half of the world's road traffic deaths occur among motorcyclists (23%), pedestrians (22%) and cyclists (5%) i.e. "vulnerable road users" with 31% of deaths among car occupants and the remaining 19% among unspecified road users (6, 32).

According to WHO (2001) estimates of the trends, compared to its 9^{th} position in 1998, RTA accounts the 3^{rd} place of the disease burden of the World among the 10 Leading Causes, in 2020 next to Ischemic heart disease and Univocal major depression (33).

2.2. Road traffic accidents in Africa

In Africa, an estimated 157,875 people aged 15 and over were killed in road Traffic accidents in 2008 (the majority of them in the 15-59 year age group). It was reported that about 10 per cent of global road deaths in 1999 took place in Sub-Saharan Africa where only 4 per cent of global vehicles are registered in the Region. Conversely, in the entire developed world, with 60 per cent of all globally registered vehicles, only 14 per cent of road deaths occurred (18, 26, 27).

Other studies revealed that the driver, the vehicle, groups of road users, the road, the general Environment, the number of vehicles on the road and animals as factors influencing risk of road traffic accidents The same study describes that human error is highly influenced by age of the driver, and alcohol consumption. For example the younger ones have less driving experience, high probability of taking alcohol to excess, high probability of over speeding and an old car is more likely to have easily burst tyros, brake failure, indicator failure and view mirror problems. (8, 11). The type of vehicles and age of vehicles were also reported as having a bearing effect for road accidents on pedestrians, cyclists and motorcyclists who are mainly found in developing countries. Unpaved roads, defects in road design, poor road maintenance, slippery roads, potholes and curves have high probability of causing accidents on the road and such defects are most common in the African countries (32).

2.3. RTA Situation in Ethiopia

Six years (July 2005 - June 2011) of police reported crash data were analysed by Getu and his collogues, and reported that, 12,140 fatal and 29,454 injury crashes on the country's road network. The 12,140 fatal crashes involved 1,070 drivers, 5,702 passengers, and 7,770 pedestrians, totaling 14,542 fatalities, an average of 1.2 road user fatalities per crash. The report also showed an important and glaring trend that emerges is that more than half of the fatalities in Ethiopia involve pedestrians and the majority of the crashes occur during daytime hours, involve males, and involve persons in the 18-50 age group Ethiopia's active workforce. Crashes frequently occur in mid blocks or roadways. Also indicated that the predominant collision between motor vehicles and pedestrians was a rollover on a road tangent section, where failing to observe the priority of pedestrians and speeding were the major causes of crashes attributed by police (34). Poor road network; absence of knowledge on road traffic safety; mixed traffic flow

system; poor legislation and failure of enforcement; poor conditions of vehicles; poor emergency medical services; and absence of traffic accident compulsory insurance law have been identified as key determinants of the problem in Ethiopia (35).

Recent study that was done in Mekele Town revealed that some of the risky behavioral factors for road traffic accidents, were: (42.3%) using mobile phone while driving vehicle, 82.3% has ever drunk alcohol and (9.7%) had an experience of drinking alcohol and driving, 62.6% of house car and (37.4%) of taxi were unfasten their seat belt while driving. According to the study in Mekele town, the reasons given by the respondents for not using seat belts were; seat belt did not have importance 10.0 % and seat belt creates discomfort 34.0%, and (14.4%) of the drivers were not following the recommended speed limit of driving in the town. In general, (66.6%) of the drivers were found to be risk groups. Out of the total drivers with risky driving behavior, 55.4%, (25.3%) and (19.3%) were house car, taxi and Bajaj drivers respectively (30). Other researchers reported in Addis Ababa on special investigation to assess the contribution of the various risk factors at the time of a crash. Although the factors cited below are the most commonly reported in routine police statistics, there are broader underlying inter-related factors contributing to the rising magnitude and burden of road traffic injuries in Addis Ababa. These include: Rapid growth in motorization and human population, increased spatial interaction of road traffic in terms of the volume and direction of movement, conditions and environment of work in the public transport sector (36, 37). Furthermore, the magnitude of RTA and its burden is getting even worse in recent years in Adama town where, fatalities, injuries and property damage in the city showed an increasing trend. From unevenly distributed 1949 spatially RTA from the study period 2004/05 to 2013/14, 264 were death, 283 were serious injuries, 359 slight injuries and 1043 were property damage (31).

2.4. Risky driving behavior and Factors associated with RTA

Various studies shows across a number of countries including Ethiopia show that the occurrence of an accident is not usually attributable to a single cause, but to the combined effects of a number of deficiencies or failures associated with the drivers, pedestrians, the vehicles and the roads. The studies also indicate environmental conditions such as the road surface, weather condition and time of the day are additional factor (6, 38, 39).

Evidences noted that human behavior is the most common factor accounting for more than 85% of all traffic accidents. The major contributions to serious road trauma are speeding, alcohol, driving when tired and the non-use of restraints. All these factors are within the control of the driver, which means that almost all road deaths and serious injuries can be prevented (15, 39).
Among the risky human behaviors is driving over the recommended speed. Studies has indicated that an increase of 1 km/h in mean traffic speed results in a 3% increase in the incidence of accident crashes and a 4-5% increase in fatal crashes (17, 18, 41). Another risky behavior identified for road traffic accident is taking alcohol and driving (42, 43). Not using seat belt while driving is additional risky behavior identified (22). Mobile phoning while driving is becoming one of the riskier behaviors as well (23, 24, 25). Knowledge, belief, attitude on risky driving behaviors and driving experience were also important aspects of risky behaviors identified with evidences (27, 28, and 30). Other researchers also frequently reported recklessness and negligence of the driver accounts to (61.3%) of the RTA and also on their report showed other condition of drivers involved in RTA were related to use of drugs that revealed over (12%) of RTAs were under influence of caffeine in kola nut, (7.74%) alcohol, and (1.62%) indian hemp (44, 45).

Findings from other countries also reported irresponsible driving behaviors like use of excessive driving speed, overtaking when there is oncoming vehicle, changing lanes without signaling, or stopping where there is no stop sign and drivers with frequent level of accusation were among the causes of RTA (46, 47). Also other studies conducted in Ethiopia and elsewhere showed that presence of risky driving behavior among drivers had statistically significant associations with RTA (30, 48). And young drivers are the one frequently involved in risk behaviors and traffic accidents than other age groups (48, 49).

3.5. Conceptual Framework on determinants of road traffic accidents

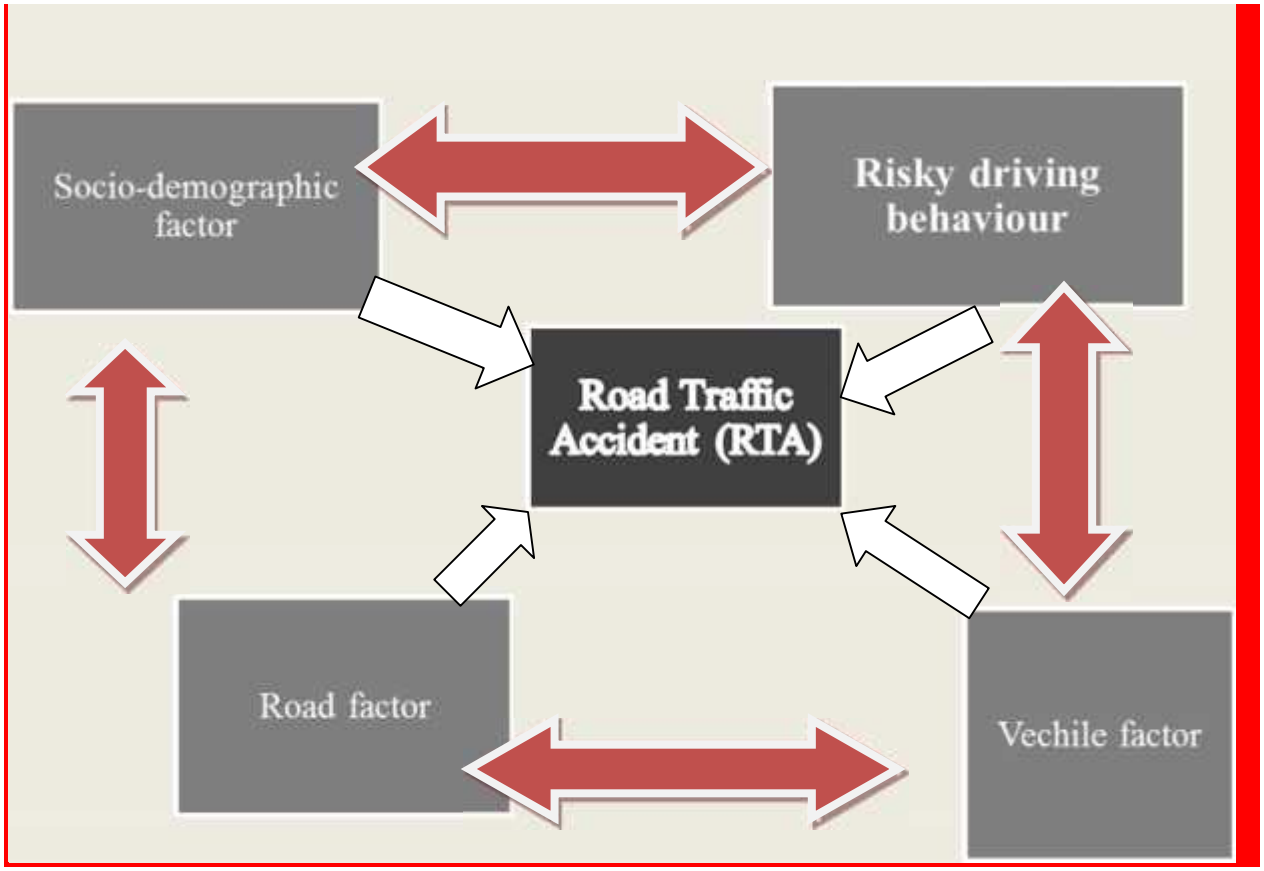

Figure 1 Conceptual Framework for the determinants of road traffic accidents among drivers and factors associated for road traffic accident, February 2015

3. Objectives

3. 1. General objective

To assess the burden of Road Traffic Accident and its determinants among drivers of Adama Town, Oromia Regional State, Ethiopia

3.2. Specific objectives

- To assess the magnitude of road traffic accident among drivers in Adama town, Oromia Regional State, Ethiopia
- To determine road related, driver related and vehicle related factors associated with road traffic accident among drivers in Adama town, Oromia Regional State, Ethiopia

4. Method

4.1. Study area and period

The study was conducted in Adama Town, East Shoa zone, Oromia regional state, Ethiopia. Adama town is located at 99 km, in the East direction from Addis Ababa, the capital city of Ethiopia. The estimated total population projection of the town was 324,000; of those, 160,380 were men and 163,620 were women. With an area of 29.86 square kilometers, Adama has a population density of 7,374.82. A total of 60,174 households were enumerated in the city (50). The estimated number of cars serving for public transport at Adama town during the data collection period was 5835.Adama city is strategically located on the main road heading into the Rift Valley from nearby Addis Ababa. The study was conducted from October, 2014 to July, 2017.

4.2. Study design

The study used a cross-sectional quantitative study design.

4.3. Population

4.3.1. Source population

All drivers in Adama town were the source population of the study.

4.3.2. Study population

Bajaj, taxi, and private car or (Automobile) drivers in Adama town

4.4. Inclusion and exclusion criteria

Inclusion criteria: Drivers of taxi, bajaj, and private (Automobile) who drove the vehicle for at least 12 months before the data collection period (October 1, 2013 to October 30, 2014) in Adama town.

Exclusion criteria: those drivers who were not willing to participate in the study were excluded.

4.5. Sample size determination and techniques

4.5.1. Sample size determination

Sample size was calculated with the assumption of proportions (P=0.22 for magnitude of road traffic accident) and with (P=0.67 for proportion of risky driving behavior) based on a previous study report from Mekele city (30)., where the calculated sample size were 264 and 340 respectively, and we finally took the largest sample size calculated by single population proportions formula for sample size determination with the following assumptions:

Where

n = the required sample size

$(Z\alpha/2)^2$ =critical value at 95%confidence interval (1.96)

Proportion (P) = proportion of risky behavior to road traffic accident is 0.67.

d = margin of error (0.05)

$$n = \frac{(Z\alpha/2)^2 \times p\,(1-p)}{d^2}$$

$$n = \frac{1.96^2 \times 0.67 \times 0.33}{0.05^2} = 340$$

The 10% of non-response rate is considered and the overall calculated sample size was 374 drivers.

4.5.2. Sampling techniques and procedure

The study respondents were initially stratified in to three homogeneous groups (Taxi drivers, Bajaj drivers and Private car or Automobiles drivers) and a proportionally sample size allocation. with systematic random sampling technique was used among the three categories of drivers. The list of the three categories of the vehicles in the town was obtained from transport office of the town and taxi and Bajaj associations. The total number of registered and licensed Taxis, Bajajs and Private cars or Automobiles in the town during the data collection period was 335, 3500 2000 respectively. Although, the data collectors used the list of the vehicles obtained from the office and associations, we faced difficult on accessing the selected respondent practical from the sampling frame. Therefore, we were forced to select 22 Taxi and 224 Bajaj drivers in their regular station randomly considering the calculated sampling intervals, and similarly 128 private car or Automobile drivers were interviewed randomly in the fuel stations (**Figure 2**).

Proportional allocation = Total sample size × total population within strata

Total population

Sample size allocated to Private car (Automobile) = 374 ×2000= 128

5835

Sample size allocated to Bajaj =374× 3500 = 224

5835

Sample size allocated to taxi = 374× 335 = 22

5835

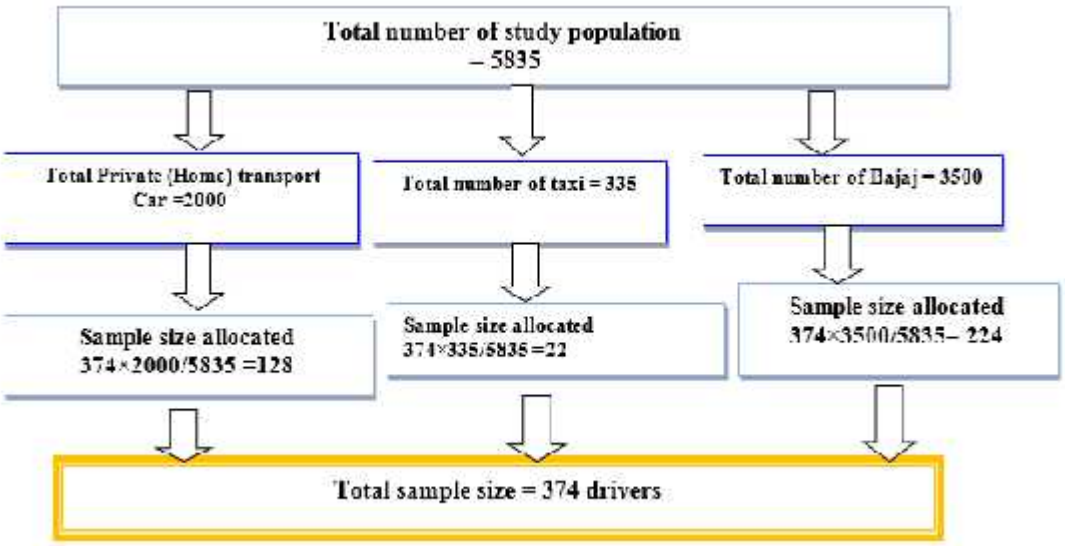

Figure 2 Schematic presentation of sampling procedure of study participants, Adama town, February, 2015

4.6. Study Variables

4.6.1. Dependent variable

- Road traffic accident in the past 12 months (October 1, 2013 to October 30, 2014) dichotomized in to Yes or No.

4.6.2. Independent variables:

Socio-demographic characteristics and personal factors

- Sex and Age of the respondent

- Marital status of the respondent
- Educational status of the respondent
- Vehicle ownership, Type of vehicle
- Monthly income of the respondent's family,
- Knowledge of the respondent
- Accusations by traffic police men

Risky driving behavior

- Habits of alcohol drinking
- Unfasten seat belt while driving
- Talking through mobile phones while driving
- Driving with excess speed beyond the limit (> 35 km/hour) in the city

Factors related to vehicle

- Service year of vehicle (Perceived vehicle age)
- Failed brake or mechanical failures

Pedestrians related factors

- Failure to respects traffic rule of zebra cross

Road related condition: congested, high traffic road, damaged roads, etc.

4.7. Operational definition

Road traffic accident: in this study is a collision between vehicles; between vehicles and pedestrians; between vehicles and animals; or between vehicles and fixed obstacle in the past 12 months (October 1, 2013 to October 30, 2014). It was assessed and dichotomized in to "Yes" if the driver self-reported experience of RTA in the past 12 months (October 1, 2013 to October 30, 2014) or "No" if the driver self-reported no RTA during the 12 months period.

Knowledge on road traffic signs: in this study the respondents were asked 30 knowledge assessment questions related to the common road traffic signs and correct responses were given a value of "1" and incorrect responses were given a value of "0" where the aggregated knowledge level was determined by summing up the correct responses made by the respondent. Accordingly, those respondents who answered below the mean level of knowledge (χ=25.484) out of 30 road traffic signs were labeled as "less knowledgeable", and those respondents who correctly answered mean or above the mean value regarding the road traffic signs were categorized as "more knowledge.

Driver: Persons in control of vehicles other than pedal cycles and two-wheeled motor vehicles

Passengers: Occupants of vehicles, other than the person in control, including extra seat/pillion passengers.

Pedestrians: People walking or riding or pushing bicycles on the street or footway.

Road: Every public road system: state, regional or local road, or city Street.

Risky driving behavior: in this study is defined if a respondent has experienced any one of the four behaviors within the specified period. The behaviors are driving after drinking alcohol and/or, unfasten seat belt within the past 12 months; excessive speed which is above 35 Km/ h within the past 12 months; mobile calling or receiving while driving within the past 12 months. The issue of seat belt is exempted for the drivers of Bajaj respondents since Bajaj is manufactured without belt. All response are subject to drivers response I the past 12 months

Road users: Pedestrians, animals and vehicle users which include all occupants (i.e. driver or rider and passengers).

Vehicle: A machine that is used to carry people or goods from one place to another, it could be bicycle, motor cycle or three and above wheeled machine.

Taxi: a vehicle, whose driver is paid to transport passengers and their light commodities, typically for short distances with in the city.

Bajaj: are those vehicles with three wheel (tier) and used to transport 3-4 persons for short distances with in the city and are used for business making.

Private cars (Automobile)**:** in this study includes those vehicles with plate codes-2 in Ethiopia which are used for personal or family transportation purpose and are not for business making.

4.8. Data collection instrument and procedure

A structured questionnaire was used to collect information related to the study objectives. Questions related to road traffic accidents and driver's behavior were adopted from related studies (9, 30) and modified to match our study context. The instrument was pretested on 10% (42) drivers one week before the actual data collection. Some findings from the pretest were used to make some adjustment especially on time per each interview and resentencing some questions. The data collectors were 4 nurses selected based on their previous experience in data collection for research work. The interviewers used a face to face interview technique with the selected study participants approached at their station for Bajaj and Taxi drivers and at the fuel station for Automobile drivers. The supervisor immediately checked the questioners for completeness and consistency and corrections were made in case of problems obtained in the collected data.

4.9. Data quality management

The quality of the data was assured by using a pretested questionnaire which was translated from English to local language Afaan Oromo and Amharic and retranslated back to English by a second translator to check for consistency. The tool was pre-tested a week before the actual data collection to improve the quality of data. A training that focused on understanding the research question, sampling technique, data handling, ethical conduct, and quality of data collection was given for two days for the data collectors and supervisors. Each data collector was used to check the questionnaires for completeness before winding up their visit to each study participant and each questionnaire were reviewed daily by the supervisors and the principal investigator to check for completeness and early corrections and cleaning of the data were made.

4.10. Data processing and analysis

The data was checked for completeness and consistencies during the data collection, then it was cleaned, coded and entered in to computer using statistical package for social sciences (SPSS) windows version 21, frequency distributions were run and further cleaning and missing values and errors were checked univariate analysis was computed to determine the distribution of the study

variables. The Bivariate analysis was computed and comparisons were made among drivers who had RTA and those who hadn't RTA; those variables with p<0.25 on bivariate analysis and those with conceptual relation with the dependent variable were recruited for Multi variable Logistic regression model. Multi variable binary logistic regression models were fitted to identify the independent predictors of RTA in the study population. Adjusted Odds ratios with 95% confidence intervals were computed for each explanatory variable to determine the strength of association of independent predictors of RTA while controlling the effect of potential confounders. Level of statistical significance was declared at P-value < 0.05. Tables, graphs and texts were used to describe the study findings.

4.11. Ethical consideration

Ethical approval was secured from designated institutional review committee (IRC) of the University of Addis Ababa (AAU), College of Health Sciences, School of Public Health. Permission letters was secured from Adama Town Administrative office, and from Adama Police Commission Bureau. Information on the purpose of the study and the right not to participate were given to the participants. Written consent was obtained from all the study participants and the information from collected from the participants was kept confidential.

4.12. Dissemination of results

The results of this study will be presented or defended to and approved by the Addis Ababa University in partial fulfillment of the Degree of Master of Public Health/Reproductive Health. The results will be submitted to Addis Ababa University, Adama Police Commission, Adama Construction Roads and Transport Agency and Oromia Regional Health Bureau and other concerned bodies through report. The report will also be kept in the libraries in both hard and electronic copies for other researchers and others interested to be used as a potential reference source. On the top of this, efforts will be made to publish the findings on local, or national or international peer reviewed journals.

5. Results

Socio-demographic characteristics

Majority 365 (97.6%) of the study participants were males by sex and while the other 9 (2.4%) were females. Regarding the age category of the respondents; most of them 238 (63.6%) were between 18-32years old, followed by 128 (34.2%) were between 33-50 years old. Nearly half 186 (49.7%) of the respondents were married and the other 172 (46.0%) were single. Regarding the highest level of schooling completed by the respondents; 207 (55.3%) were 9-12th grade complete, followed by 118 (31.6%) of the respondents had college or above college level education completed (**Table 1**).

Table 1 Demographic and socio-economic characteristics of respondents, Adama town, Oromia region, Ethiopia, February, 2015

Variable	Category	Frequency	Percent
Age of respondent	18 – 32 years	238	63.6
	33 – 50 years	128	34.2
	>50 years	8	2.1
Sex of respondent	Female	9	2.4
	Male	365	97.6
Marital status of respondent	Single	172	46
	Married	186	49.7
	Other (Divorced & Widowed)	16	4.3
Educational status of respondent	<= 8thgrade	49	13.1
	9-12thgrade	207	55.3
	College and above	118	31.6
Monthly family income/Birr/	1500-2000	111	29.7
	2500-3000	176	47.1
	>3000	87	23.3
Vehicle ownership	Yes	265	70.9
	No	109	29.1
Driving license self-reported	Yes	342	91.4
	No	32	8.6

Knowledge of respondents about traffic signs

Knowledge of respondents was tasted by asking a series of 30 questions related with basic traffic signs. Traffic signs like (photos of Pedestrian crossing, Road narrows on both sides, entering a one-way street, on a express road, slow down your speed, automobiles no overtaking, closed to

automobiles, no parking, no entry, and maximum speed is 35 kms per hour and stop and give way etc). Nearly half 180 (48.1%) of the respondents were less knowledgeable while the other 194 (51.9%) were more knowledgeable to the basic traffic signs posted in the town.

Risky driving behaviors

Risky driving behavior was determined when a respondent has experienced one of the four behaviors: driving after drinking alcohol, driving without fastening seat belt, driving with high speed (>35 Km/h) in the city and habit of talking through mobile phone while driving.

Among the total respondents 157 (42%) reported the habit of drinking alcohol; among those alcohol drinkers 125(79.6%), 25(15.9%), 7 (4.5%) reported the habit of drinking alcohol after, before and while driving car respectively. Only 150 participants were eligible to the assessment related with the use of seat belt because, those drivers who drive Bajaj have no seat belt and were excluded for this question. Out of the 150 respondents who drive cars that have safety or seat belt; about40 (26.7%) were not using seat belt while driving in the city. Out of those who didn't fasten seat belt, 35 (87.5%) claimed feeling dis comfortable with safety belt was the reason for not fastening it while driving.

Regarding driving speed in the city as a risky driving behavior; one third 125 (33.4%) of the drivers self-reported the habit of driving with a speed of > 35 km/hour in the city, while the other 249 (66.6%) had no habit of driving with excess speed beyond the limit. More than half 210 (55.1%) of the respondents self-reported the habit of using (communication) with mobile phone while they drive, whereas, the other 164(43.9%) of them had no the habit of talking (communication) through mobile phone while driving a vehicle. The two major claimed reasons for talking with mobile phone while driving were: the need not to miss phone calls from customers reported by 96(45.7%) and the need not to miss emergency call from family members was reported by 93 (44.3%) of the respondents. While the two main reasons given by those drivers who had no habit of talking through phone while driving were; 149 (89.6%) reported that it is a dangerous habit that leads to accidents and the other 17 (10.4%) reported reason for not talking through mobile phone while driving was fear of punishments by traffic police men.

In general, 285 (76.2%) of the drivers had risky driving behavior (drive after drinking alcohol and/or, unfasten seat belt within the past 12 months and/or drive with excessive speed of >35 Km/

h within the past 12 months and/or communicate with mobile phone while driving within the past 12 months). Among the 224 Bajaj, 128 Private car or Automobile, and 22 Taxi drivers who were successfully interviewed; a total of 191(85.3%), 79(61.7%), and 15(68.2%) of the Bajaj, private car or Automobile, and taxi drivers respectively had risky driving behavior (**Table 2**).

Table 2 Risk driving behavior among study participants, Adama city, Oromia regional state, Ethiopia, February, 2015

Variable	Category	Frequency	Percent
Drink alcohol before or while driving	Yes	30	8
	No drink at all or drink after driving	344	92
Unfasten seat belt while driving within the past 12 months	Not fasten seat belt while driving	40	10.7
	Use seatbelt when driving	110	29.4
	Not applicable (Bajaj drivers)	224	59.9
Driving speed in the city above 35 Km/h within the past 12 months	Yes	125	33.4
	No	249	66.6
Habit of Mobile calling or receiving while driving	Yes	210	56.1
	No	164	43.9
Risky driving behavior	Have no risky driving behavior	89	23.8
	Have risky driving behavior	285	76.2

Km/h: Kilometer per hour

Burden of Road traffic accident in Adama town

More than half of the respondents 211(56.4%) reported road traffic accidents, while the remaining 163 (43.6%) of the respondents had no history of road traffic accident during the previous 12 months before the data collection. The major perceived reason for the most recent RTA includes: 54(25.6%) of them reported the most recent accident was problems related with the road (sign of zebras faded, damaged road, congested road, etc), 49(23.2%) reported problems related with the driver including the use excessive speed beyond the limit, 48 (22.7%) reported problems related with the vehicle (mechanical or technical failures occurred during the event) and the remaining 60(28.44%) reported problems due to a combination of reasons (problems related with the road, driver and vehicle).

Perception of the study participants about the magnitude of RTA in Adama City was assessed and majority 235 (62.8%) of the study participants perceived that RTA is increasing in Adama city. The most common perceived reasons for RTA among respondents who perceived increased RTA in the town includes: 118 (50.2%) of them perceived that the common factors for the increased RTA in Adama town are related to the drivers (lack of skill or not obeying the traffic rules), 66 (28.1%) problems related to the pedestrians (not respecting traffic rule), and 51(21.7%) problems related with the quality of the road (congested road, Zebra sign not visible, damaged road etc).

Nearly a third quarter 276 (73.8%) of the total respondents were accused by traffic police men during the 12 months before the data collection date. The most common reported reasons for the punishments or the accusation in the last 12 months includes; 115(41.7%) were due to breaching the traffic rule, 87 (31.5%) were due to failure to give ways to pedestrians, 43 (15.5%) were accused due to driving with high speed beyond the limit (**Figure 3**).

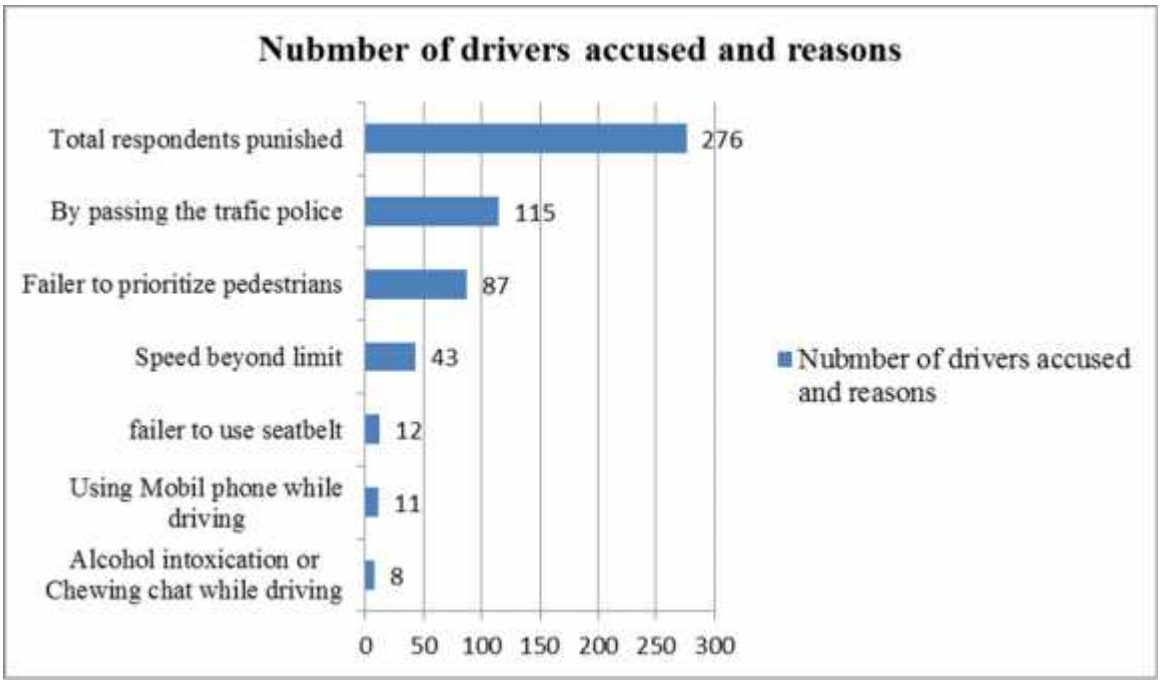

Figure 3 Number of study participants who were accused by Traffic police men in Adama town, Oromia regional state, Ethiopia, February, 2015

Factors associated with road traffic accident

Bivariate and multivariate logistic regressions were done to determine statistically significant association with Road traffic accident. The variables which had statistically significant association ($p<0.05$) with road traffic accident in this study area includes: drivers with risky driving behavior, accused by traffic police men, and type of vehicle the respondent drive.

Respondents who had risky driving behavior were more than eight times more likely [AOR=8.336 (95%CI: 4.340, 16.011)] to have RTA in the 12 months period, than those drivers who had no risky driving behavior.

And respondents who were accused by traffic police men in the 12 months period were nearly six times [AOR= 6.550 (95%CI: 3.600, 11.917)] more likely had RTA in the previous one year than those drivers who were not accused by traffic polices during the specified period.

Taxi drivers were four times more likely [AOR=4.062 (95%CI: 1.009, 16.384)] had road traffic accident than those who drive Bajaj during the 12 months period before the data collection period (**Table 3**).

Table 3 Factors associated with Road traffic accident among drivers in Adama City, Oromia region, Ethiopia, February, 2015

Variable	Category	RTA in the last 12months		COR (95 % CI)	AOR (95 % CI)
		No Freq(%)	Yes Freq(%)		
Age of respondent	18-32 years	105(44.1)	133(55.9)	1	1
	33-50 years	54(42.2)	74(57.8)	1.082 (0.701, 1.670)	1.230 (0.724, 2.090)
	>50 years	4(50.0)	4(50.0)	0.79(0.193, 3.231	0.874(0.129, 5.933)
Educational status	<= 8th grade	21(42.9)	28(57.1)	0.947 (0.483, 1.858)	1.165 (0.500, 2.711)
	9-12th grade	93(44.9)	114(55.1)	0.871 (0.551, 1.375)	1.082 (0.622, 1.881)
	College and above	49(41.5)	69(58.5)	1	1
Marital status	Single	75(43.6)	97(56.4)	0.776 (0.270, 2.231)	0.851 (0.226, 3.207)
	Married	82(44.1)	104(55.9)	0.761 (0.266, 2.180)	0.895 (0.240, 3.343)
	Other (Divorced & Widowed)	6(37.5)	10(62.5)	1	1
Vehicle ownership	Yes	114(43.0)	151(57.0)	1.082 (0.690, 1.695)	0.784 (0.434, 1.417)
	No	49(45.0)	60(55.0)	1	1
Knowledge status of road traffic signs	Less knowledgeable	82(45.6)	98(54.4)	0.857 (0.569, 1.290)	0.931 (0.562, 1.541)
	More knowledgeable	81(41.8)	113(58.2)	1	1
Perception of RTA magnitude	Yes	84(35.7)	151(64.3)	***2.367 (1.542, 3.634)***	1.510 (0.901, 2.529)
	No	79(56.8)	60(43.2)	1	1
Risky driving behavior	Has risky DB	***94(33.0)***	***191(37.0)***	***7.01 (4.02, 12.22)***	***8.34 (4.34, 16.01)***
	Has no risky DB	96(77.5)	20(22.5)	1	1
Accused by traffic police men during last 12 months	Yes	***88(31.9)***	***188(68.1)***	***6.97 (4.09, 11.85)***	***6.55(3.60, 11.92)***
	No	75(76.5)	23(23.5)	1	1
Drivers category	Taxi driver	6(27.3)	16(72.7)	2.151 (0.812, 5.699)	***4.06 (1.01, 16.38)****
	Automobile	57(44.5)	71(55.5)	1.005 (0.649, 1.555)	1.57 (0.88, 2.79)
	Bajaj driver	100(44.6)	124(55.4)	1	1

COR: Crude odds ratio, AOR: Adjusted odds ratio, CI: Confidence interval, DB: Driving behavior *p<0.05, **p<0.001

Discussion

The current study assessed the magnitude of RTA and risky driving behavior among private owned cars (Automobile), taxi and Bajaj drivers in Adama town. The twelve months period road traffic accident level in Adama town among the study groups was very high and nearly half of the most recent causes of RTA were perceived due to human error (pedestrian (25.6%) and driver related (23.2%). Driving behaviors that increases the risk of accident occurrences like driving speed, alcohol drinking, talking through mobile phone and the non-use of seat belts were very common among the study participants. And all these factors are within the control of the driver, which means that almost all road deaths and serious injuries related with driver's risky driving behavior can be prevented. The loss of life and the cost to the community are unnecessary burdens that can be reduced with greater care and more responsible behavior by all drivers and pedestrians too.

The magnitude of RTA and presence of risky driving behaviors among the study subjects during the 12 months period was much higher than the magnitude of RTA (22%) and risky driving behavior (66.6%) reported in Mekele city (30). This variation could be due to differences in the study setting, sampling technique and the quality of the roads in the two cities. Particularly many trucks and vehicles by pass Adama town and increase the overcrowding condition of the roads.

The most common conditions related to the drivers behavior or skill equally reported by this study and previous studies includes behaviors like the use of excessive speed beyond the limit, overtaking when there is oncoming vehicle, not giving ways to pedestrians, careless driving and lack of driving skill like changing lanes without signaling, or stopping where there is no stop sign (51, 52). Although, most of the previous study reports agree on the recklessness and negligence of the driver at the incident of the RTA, they also reported condition related to the use of drugs like: (12%) caffeine in kola nut, and (7.74%) alcohol (44, 45, 52). The possible reason for no report of substance use at the event of the most recent RTA in this study could be due to intentional underreporting of once own error related to substance use.

Besides the reasons related to the driver, this study also identified poor condition of the vehicles that lead to mechanical or physical failures at the moment of the RTA. It also uncovered poor

conditions of the road with poorly visibly or faded sign of zebras, and very congested or crowded road conditions where pedestrians were not giving way for vehicles during the event. And this finding also agrees to the findings reported by other studies that reported multi factorial causes of RTA like mechanical defects in the vehicle accounted to (8.4%), careless crossing of the road by pedestrians (12.7%), bad road condition and other less important causes accounted for (17.6%) of the RTAs (6, 30).

The current study didn't detected age difference in incidence of RTA in Adama town. Though this finding agrees with the study conducted in Ethiopia; it is in the contrary to evidences elsewhere that have demonstrated that young drivers are frequently involved in highest proportion of traffic accidents than other age groups (51, 52). Similarly there was also no significant difference observed in RTA among drivers based on their educational level, where as other studies reported the presence of association between education and incidences of RTA (30). Our study determined risky driving behavior when the respondent had experienced one of the four behaviors: driving after drinking alcohol, driving without fastening seat belt, driving with high speed (>35 Km/h) in the city and habit of talking through mobile phone while driving. The most common risky driving behavior among the drivers in Adama town was talking through mobile phones while driving 210 (55.1%), followed by the uses of excessive speeds in the city beyond the limit and driving without fastening seat belts of 125 (33.4%) and 40 (26.7%) respectively. Although the proportion of alcohol drinking among the drivers in general is high 157 (42%), the habit of driving after alcohol drinking was reported only by 7(4.5%) of the study subjects which is in line with findings from Mekele city, Ethiopia that reported though great majority 288 (82.3%) of respondents ever drink alcohol only 28 (9.7%) had an experience of drinking alcohol and driving within the last 12 months (30). Similar to the findings of a study done in Mekelle that revealed 148 (42.3%) of the drivers were using mobile phone while driving vehicle our study also identified that the habit of talking through mobile phones while driving was one of the major risky driving behavior among drivers in Adama city. This could be due poor understanding of drivers about risks related to such hazardous behavior and due to carelessness of the drivers to obey driving laws or poor enforcement of the driving rules by the traffic police men in the city.

Drivers with risky driving behaviors were more than eight times more likely to be involved on RTA during the specified period. And our finding is in line with the findings of other studies

conducted in Ethiopia and elsewhere that showed that presence of risky driving behavior among drivers had statistically significant associations with RTA (34, 55). The study that was done in Diredawa city the overall findings of this study indicated that the prevalence of road traffic accidents was associated with various factors like nearly 80% of the risk factors were associated with driver fault (human risk behavior) which was similar finding to a study conducted in Mekele town, where 96% of the causes of road traffic accidents were related to human risk behavior (56). Not giving priority to pedestrians is the most potent contributor to road traffic accidents in Dire Dawa city and some other countries like Nigeria and India (57). For example, a study conducted in India indicated that human characteristics, such as rushing and negligence make up 95.4% of the total road traffic accidents (58). In line with this research speeding is another factor which took the second place crashes in Dire Dawa city and Amhara National Regional State the speed factor alone accounted for more than 31.5% of the crash.

The study also revealed majorities of accidents at Dire Dawa city were due to pedestrian's wrong crossing of the road .The articles that revealed how road traffic accident was a major problem, but neglected health problem in Ethiopia which was done with secondary data by the Amhara National Regional State Police Commission from 2007-2011 (59). Fatalities due to traffic accidents are reported to be among the highest in the world. According to the WHO's 2009 global status report on road safety, the road crash fatality rate in Ethiopia was at least 114 deaths per 10,000 vehicles per year, compared to only 10 in the UK and Ireland and 60 across 39 sub-Saharan African countries (57,60). In addition, the number of people injured or killed in one crash in Ethiopia is about 30 times higher than that in the US (61). Furthermore, it is sad to note that fatalities due to road traffic accidents are higher among pedestrians in countries like Ethiopia than in developed countries. For instance, 60% of the fatalities in the US account to the car drivers, while in Ethiopia only about 5% account to drivers (60). This is also supported by a recent study where the majority of fatalities were pedestrians (87%) followed by passengers (9%) and drivers (4%) among a total of 25,110 accidents and 3415 fatalities during the period 2000-2009 in Addis Ababa (62).

Accusation of the driver by traffic police men and the type of vehicle the driver droves were the other independent predictors that determined RTA during the 12 months period in Adama town. On multivariate analysis respondents who were accused by traffic police men were more than six

times involved in RTA, than drivers who were not accused during the 12 months period. There is also some association between drivers who frequently break traffic rules, who overpass vehicles, who stop in wrong places and those who frequent accusation and the tendency to encounter RTA reported elsewhere (47, 62). This can be due to the reality that the more the driver committed RTA the more likely he could be punished or accused by traffic policemen, or it may indicate that it was those drivers oftentimes who were break driving rules and punished were also commit RTA.

The type of vehicle the respondent droves were independently associated with the occurrences of RTA. Taxi drivers were four times more likely had road traffic accident than the three wheel drivers. And difference in incident of RTA varies with vehicle type according to previous studies that reported, the type of vehicles and age of vehicles were had a bearing effect for road accidents on pedestrians, cyclists and motorcyclists who are mainly found in developing countries (62). This could be the poor mechanical and technical status of most of the taxis that served for a long period of time were more likely to collide in cases of potential accident events which could be avoided if the type of car were in a good condition. And in line with most of the three wheel vehicles that work in the town are relatively newer with small number of service year.

Strength and limitation of the study

Strength- un like previous studies that are mostly hospital based, the finding of this research tries to find out RTA and risky driving behavior and associated factors for road traffic accident in Adama town, Ethiopia.

Limitation- there is a potential selection bias as a result of recruiting the study participants in their working station instead of their household.

Conclusion and recommendations

The magnitude of road traffic accident and risky driving behaviors were very high among Bajaj, Automobile and Taxi drivers in Adama town. Reasons related to the drivers behavior, the vehicle status, and the pedestrians or the road were the leading perceived causes of road traffic accident during the study period. Driving behaviors that increases the risk of accident occurrences like driving speed, alcohol drinking, talking through mobile phone and the non-use of seat belts were very common among the study participants in Adama town.

The regional and Adama town transport authority and police authority are recommended to develop strategy that helps to improve the understanding of the community on safe use of roads. Periodic education to drivers in the town about safe driving and the effects of risky driving behavior shall help to improve the situation of modifiable factors including driver's behavior and skill.

The regional and national road and transport authorities should maintain road side traffic signs and label roads with necessary signs that inform drivers and pedestrians of accident risks so that road traffic accidents attributed to poor quality of the road could be minimized in Adama town.

Adama town transport and police authority should enforce the existing laws and adopt proven road safety interventions for risk drivers identification mechanisms like alcohol breath test and the like.

Formulate better risk identification strategies like systematic recording and monitoring system of driver and vehicle hence accidents as a result of poor condition of vehicles or mechanical failures of the vehicle could be minimized.

References

1. TRL., Ross Hillock Partnership, Study for Sectoral Road Safety Program in Ethiopia, Volume II, Transport Research Laboratory: A review and assessment of methodological alternatives," Accident; Analysis and Prevention, 2011; 43:1666–76.
2. Kifle H., Application of data mining technology to support the prioritization of dangerous crash location: the case of Addis Ababa traffic office," Master's thesis, Addis Ababa University, 2009.
3. WHO: Global status report on road safety time for action, Switzerland, Geneva; 2009.
4. TRL., Overseas Road Note 10- Costing Road Accidents in Developing Countries. TRL. Crowt home. UK. 1995.
5. World Bank., Road Safety a Lethal Problem in the Third World. The Urban Edge, 14 (5), June 1990.
6. World Health Organization., Global status report on road safety: time for action. World Health Organization: Switzerland, Geneva, 2009.
7. The Management of Commercial Road Transport in Ethiopia'2009.
8. Tesema TB, Abraham A, and Crina G., "Rule mining and classification of road traffic accidents using adaptive Regression trees," International Journal Of Simulation, 2005; 6(10 and 11), ISSN- 80 1473-8031.
9. Regassa Z., "Determining the degree of driver's responsibility for car accident: the case of Addis Ababa traffic office," Master's thesis, Addis Ababa University 2009.
10. Saunier N, Mourji N, Agar B., ,"Investigating collision factors by mining microscopic data of vehicle conflicts and collisions," A report paper, 2010.
11. Savolainen PT, Mannering FL, Lord D, Kudus MA., "The statistical analysis of highway crash-injury. WHO Status Report on Road Safety in Countries of the. African Region, 2010.
12. Federal Democratic Republic of Ethiopia: Police Commission Report, Addis Ababa; 2007.
13. Yilma B, Million T, Luce T., Motor vehicle accident and fatality surveillance Addis Ababa, Ethiopia from 2000-2009 Addis Ababa; 2010.
14. Adama Town Police Commission Office: Report on road traffic accident, Adama; 2013.
15. Peden M, Scurfield R, Sleet D., World report on road traffic injury prevention 2004.

16. Finch J, Kompfner P, Lockwood R, Maycock G., Speed limits and accidents Transport Research Laboratory; 1994.

17. Transport Research Centre: Speed management report Paris; 2006.

18. Barengo C, Mkamba M, Mshana M, Miettola J., Road traffic accidents in Dar-es-Salaam, Tanzania during 1999 and 2001. Int J Inj Contr Saf Promot 2006, 13:52-54.

19. Waller F, Stewart J, Hansen A., The potentiating effects of alcohol on driver injury. J Am Med Assoc 1996, 255:522-527.

20. Gururaj G., Alcohol and road traffic injuries in South Asia: challenges for prevention. J Coll Phys Surg Pakistan 2004, 14:713-718.

21. European Transport Safety Council: Seat-belts and child restraints: increasing use and optimizing performance Brussels; 1996.

22. Cummings P, McKnight B, Rivara P, Grossman C., Association of driver air bags with driver fatality: a matched cohort study. BMJ 2002, 324:1119-22.

23. US department of transportation: Traffic Safety Facts Washington, DC; 2009.

24. AAA Foundation for Traffic Safety: Cell Phones and Driving Washington, DC; 2008.

25. Mike M., Traffic crash victimizations of California children and teenagers by drinking over-21 drivers. Californian J Health Promotion 2009, 7:92-101.

26. Sayder A, Downing A., Driver knowledge of road safety factors in three developing countries. TRRL Supplementary report 713 1981.

27. Deus K: Risk factors and road traffic accidents in Tanzania; a case study of Kibaha district Trondhein; 2006.

28. Veysel Y, Eray H., Risk driving attitudes and self reporting traffic violations among Turkish drivers. 2006, 7(1):127-138.

29. Berg L., Drinking and driving: intentions, attitudes and social norms of Swedish male drivers. Accident Anal Prev 1993, 25:289-296.

30. Abrahim H, Ameyu G, Lakew A, Eshetu G., Risky driving behaviors for road traffic accident among drivers in Mekele city, Northern Ethiopia. BMC Research Notes 2011; 4:535.

31. Berhane G. GIS Based Assessment of Road Traffic Accidents in Adama (Nazerth) City). June, 2015 (Masters Thesis)

32. World Health Organization: “Global Status Report on Road Safety: supporting a decade of action": Official report. Geneva, Switzerland 2013.

33. World Health Organization: A 5-Year WHO Strategy for Road Traffic Injury Prevention. Geneva, Switzerland 2001.

34. Getu S, Simon W, Mark J., Characteristics of Police-reported Road Traffic Crashes in Ethiopia over a Six Year Period. Proceedings of the 2013 Australasian Road Safety Research, Policing & Education Conference 28th – 30th August, Brisbane, Queensland. 2013.

35. Persson A., Road traffic accidents in Ethiopia: magnitude, causes and possible interventions. Advances in Transportation Studies an international Journal Section A 15; 2008.

36. Berhanu G., Effects of Road Safety and Traffic factors in Ethiopia. A thesis report, Norwegian University of Science and Technology, Trondheim. 2000.

37. Al-Haji G., Road Safety Development Index: Theory, Philosophy and Practice. PhD Dissertation report, Linkoping University of Technology, 2007.

38. Boontob N, Tanaboriboon Y, Kanitpong K, Suriyawongpaisal P., Effect of seat belt use on road accidents inThailand. Transport Res Rec. J Transport Res Board 2008, 2038(2007):84–92.

39. Elder RW, Voas R, Beirness D, Shults RA, Sleet DA, Nichols JL, et al., Effectiveness of ignition interlocks for preventing alcohol impaired driving and alcohol-related crashes: a Community Guide systematic review. Am J Prev Med. 2011;40: 362-76.

40. Department of Transport, Driver and Vehicle Services. Drive Safe: A handbook for Western Australian road users. Government of Australia. 2014.

41. Finch J, Kompfner P, Lockwood R, Maycock G., Speed limits and accidents Transport Research Laboratory; 1994.

42. Waller F, Stewart J, Hansen A: The potentiating effects of alcohol on driver injury. J Am Med Assoc 1996, 255:522-527.

43. Gururaj G., Alcohol and road traffic injuries in South Asia: challenges for prevention. J Coll Phys Surg Pakistan 2004, 14:713-718.

44. Asogwa SE., Some characteristics of drivers and riders involved in road traffic accidents in Nigeria.East African Medical Journal. 1980; **57**:399-404.

45. Asogwa SE,. Kola nut and road traffic accidents in Nigeria. American Journal of Public Health . 1978; 68:1228.

46. Young K, Regan M, Hammer M., Driver distraction: a review of the literature. Monash University Accident Research Centre, 2003.

47. Wen CP, Tsai SP, Cheng TY et al., Excess injury mortality among smokers: a neglected tobacco hazard. Tobacco Control, 2005; 14 (Supplement 1): 28-32.

48. Bjorn S., Globalization in road safety explaining the dawn ward trend in road accident rates. 2000, Isreal, 32 (1): 71-4.

49. AMichon J., What do we know what should we do: human behavior and traffic safety. 1995, Plenum Press, 485-524

50. Central Statistical Agency. Population and housing census report of Ethiopia. Addis Ababa, 2008.

51. Bjorn S: Globalization in road safety explaining the dawn ward trend in road accident rates. 2000, Isreal, 32 (1): 71-4.

52. Guyu F. Identifying Major Urban Road Traffic Accident Black Spots: A Sub-city Based Analysis of Evidences From the City of Addis Ababa, Ethiopia. Journal of Sustainable Development in Africa. 2013; 15(2).

53. Peter T. Review of Accident Causation Models used in Road Accident Research. Vehicle Safety Research Centre. 2010; United Kingdom.

54. UN, ECONOMIC COMMISSION FOR AFRICA: Case Study: Road Safety in Ethiopia. 2009.

55. Sleet D, Baldwin G, Dellinger A, Dinh-Zarr B (2011) The Decade of Action for Global Road Safety. Journal of Safety Research 42: 147–148 [PubMed]

56. World Health Organization (2008) The Global Burden of Disease: 2004 update. World Health Organization Geneva.

57. Mohan D (2002) Road safety in less-motorized environments: Future concerns. Int J Epidemiol 31: 527–532 [PubMed]

58. Nantulya VM, Reich MR (2002) The neglected epidemic: Road traffic injuries in developing countries. BMJ 324: 1139–1141 [PMC free article] [PubMed]

59. Hailu F, Mekonnen, Teshager S. Road traffic accident: the neglected health problem in Amhara National Regional State, Ethiopia.*Ethiop J Health Dev* 2014; 28(1):3-10.

60. World Health Organization (WHO). Global status report on road safety: Time for action. Geneva; WHO, 2009.

61. Persson A. Road traffic accidents in Ethiopia: Magnitude, causes and possible interventions. *Advances in Transportation Studies* 2008; 15:5-16.

62. Tumato M, Bekele Y. Motor Vehicle Accident Surveillance, Addis Ababa, 2009.

Annexes

Annex 1. Consent form (English)

My name is _____. I am the staff of the Adama hospital and working as a data collector in this research project. I am interviewing among drivers of Tax/Bajaj/private cars (automobile) who drive at least for the least one year in Adama town (October 1, 2013 to October 30, 2014). The information you are going to provide will help the investigator to identify those risky driving behavior among all drivers in Adama town and to investigate other factors associated with road traffic accident which is becoming the major of public health concern. You are selected by chance and I am going to ask you some questions which are not difficult to answer. The questions are related to your socio-demographic, knowledge, attitude and physical factors related for road traffic accident.

Your name will not be written in this form and will never be used in connection with any information you tell me. All information you will give will be kept strictly confidential. Your participation is voluntary and you are not obligated to answer any question which you do not wish to answer. The interview will take about 15-20 minutes and if you fill discomfort, please be free to skip questions or withdraw from participation at any time you want. If you have any unclear question, you can ask me. If you have no question and if it is clear, could I obtain your permission to continue?

1. Yes, (say thanks & obtain her/his signature to continue)
   Signature----------
2. No, (say “thanks and you can go”)

I. Participant Information Sheet /Detailed one/

Code number of the participant _____ Type of Vehicle: _____

My Name is _____I am A Nurse working as a data collector for the study being conducted in in Adama Town by Addis Wordofa, who is studying his master‘s degree at Addis Ababa University, College of Medical and Health Sciences. I kindly request you to lend me your attention to explain you about the study and being selected as a study participant.

The study title: The Assessment of road traffic accident and risky driving behavior among drivers in Adama town, Oromia regional state, Ethiopia

Purpose of the study: The findings of this study can be of a paramount importance for peoples to understand alarmingly increasing of road traffic accidents associate with risky driving behavior in Adama town to plan intervention programs on the area which has gap and to identify other physical factors in your community ; there by will improve risky driving behaviors in general. Moreover, the aim of this study is to write a thesis as a partial requirement for the fulfillment of a Master‘s Program in Public Health for the principal investigator.

Procedure and duration: I will interview you using a questionnaire to provide me with pertinent data that is helpful to the study. There are questions to answer where I will fill the questionnaire by interviewing you. The interview will take 20 minutes, so I kindly request you to spare me this time for the interview.

Risks and benefits: The risk of participating in this study is very minimal, but only taking 20 minutes from your time. There would not be any direct payment for participating in this study. But the findings from this research may reveal important information for the concerned body

Confidentiality: The information you will provide us will be confidential. There will be no information that will identify you in particular. The findings of the study will be general for the study community and will not reflect anything particularly of individual persons. The questionnaire will be coded to exclude showing names. No reference will be made in oral or written reports that could link participants to the research.

Rights: Participation in this study is fully voluntary. You have the right to declare to participate or not in this study. If you decide to participate, you have the right to withdraw from the study at any time and this will not label you for any loss of benefits which you otherwise are entitled. You do not have to answer any question that you do not want to answer.

Contact address: If there are any questions or enquires any time about the study or procedures, please contact: Principal investigator: Addis Wordofa Mobile: 0921685881, and email: addiswordofa30@yahoo.com

Annex 2.Questionnaire (English)

Instruction 1: Before the interview ask the driver if his/her first willingness to be interviewed and to be highlighted about risky driving behavior and factors associated with road traffic accident. After permission is obtained, fill the following information from the paper sheet.

1. Socio-demographic characteristics

Code-no.	Questions	Response	Remark
101	For how long you continuously worked/drove this or similar vehicle (Taxi/Bajaj/Automobile) in Adama city????	_____ Months	
102	Age of respondent	1 Between_18 &32- years 2 Between33-50 3 Above 50 years	
103	Sex of respondent	1- Male 2- Female	
104	Marital status	1. Never married 3. Divorced/separated 2. Married 4. Widowed	
105	Educational status	1. Primary (1-8) 2. Secondary (9-12) 3. Tertiary (TVET/college/university)	
106	What is your Religion?	1-orthodox 2-Muslim 3-protestant 4-catholic 5- Other	
107	Do you have driving license?	1-yes 2-No	
108	For How long you drive this vehicle?	_____ years/ (write # of years)	
109	Who is the owner of the car? (Vehicle ownership)	1. Your car 2. Not your car	
110	For a total of how many years this vehicle served?	_____ number of years	
111	How much your monthly income?	1-1500-2000ETHB 2-2500-3000ETHB 3-above 3000ETHB	
112	How fast you drive in a city? (What is your driving	1. < 35km/hr	

	speed range during your usual working time?)	2. 35- 40km/hr 3. >= 40km perhr	

2. Question on traffic sign knowledge

S.No	What is the meaning of the Signs? Give your answer accordingly	Alternative answers	Remark
201		A. Pedisterians road B. Children C. School infront D.	
202		A - Move into one lane B - Road narrows on both sides C - Dual carriageway ends D - One way traffic straight ahead	
203		A - You are entering a one-way street B - You have priority over oncoming vehicles C - Motorway ahead D - Lane for heavy and slow vehicles	
204		A - On a Ring road B - On a Motorway C - Approaching a Roundabout D - In a Car Park	
205	What is the preferred shading color for road range on which	A. Yellow B. Green C. Blue	

	vehicle drove on?	D. Brown	
206	What is the mark of a sign post for massages that give command?	A. Circle B. Triangle C. Rectangle D. Blue background	
207		A - On a slip road on a motorway B - In a motorway service area C - On the motorway hard shoulder D - Under a motorway bridge	
208		A - Service Area Ahead B - Road Noise C - Slippery Road Ahead D - Danger Ahead	
209		A - Near a school crossing B - At a playground entrance C - On a school bus D - At a 'pedestrians only' area	
210		A - No route for pedestrians and cyclists B - A route for pedestrians only C - A route for cyclists only D - A route for pedestrians and	

		cyclists	
211		T-No U-turn_____	
212		S- No Entry_____	
213		R- No overtaking_____	
214		Q- Hospital ahead sign_____	
215		P- Disabled persons parking	
216		O- No entry for pedestrians	
217		N- Pass either side_____	

218		M- Max speed limit 30km/h	
219		L- Parking prohibited_____	
220		K_ No left turn_____	
221		J- Zebra crossing sign____	
222		I- School crossing patrol ahead sign_____	
223		H- Frail pedestrians likely to cross road ahead sign____	
224		G- Slippery road sign-_____	
225		F- Two-way traffic crosses one-way road____	
226		E- Roundabout sign_____	

227		D- Bend to right sign_____	
228		C- Road narrows on both sides sign_____	
229		B- Junction on bend ahead sign_____	
230		A-Crossroads sign_____	
231	Drivers knowledge (numer of correct answers	_____ # of correct answers	

3. Drivers behavior assessment questions

Code no.	Questions	Response result	Remark
301	Do you have a habit to talk through or use mobile telephone while you are driving?	1. yes 2. No	
302	If you say yes to Q301, what is your reason?	1. That person could be my customer, 2. I do not want to miss business 3. It could be for any emergency situation 4. Please specify any Other reason _____ _____ _____	
303	If you say "No" to Q301, what is your reason for the behavior?	1. Because the lows forbids me 2. I fear the traffic police not to punish me 3. It could destruct my driving attention 4. I fear related accident 5. Please specify any Other reason	

		_____ _____ _____	
304	Do you drink Alcohol drinks?	1. Yes 2. No	
305	If you say "yes" to Q304, how often or when do you normally drink?	1. Always before driving 2. Some times before driving 3. In between driving intervals 4. Always, I drink after driving 5. Please, specify the drinking habit of the respondent in relation to work/driving _____ _____ _____	
306	How often do you use or fasten your seat belt while driving in the town?	1. Always I fasten seat belt while driving 2. Sometimes, I may not fasten seat bels while driving 3. I do not use/ fasten seat belts 4. Please, specify the behaviour of seat belt use _____ _____	
307	What is your usual / favorite speed level you prefer while driving in the town?	_____ km/hour (please write the preferred driving speed of the driver in Km per hour)	
308	Do you smoke cigarettes?	1. Yes 2. No	
309	If you say "Yes" when do you normally smoke?	1. Sometimes, I smoke while I drive 2. Always, before or after driving 3. Please, specify the smoking in relation driving _____	
310	Do you chew Kchat?	1. Yes 2. No	
311	If you say "Yes" to Q310, when do you normally chew?	1. I chew also while driving 2. Always before driving, 3. After driving, but not while driving 4. Please, specify the smoking in relation driving _____	

4.Road traffic accident and related information

Q #	Questions	Alternative answers	Remark
401	Do you have encountered RTA in the last one year? (collision between vehicles; between vehicles and pedestrians; between vehicles and animals; or between vehicles and fixed obstacle)	1. Yes 2. No	
402	If you say "Yes" to Q401, how do you perceive about the reason for the last RTA incident you had?	1. It was due to high driving speed 2. There were invisible traffic signs 3. Pedisterians error 4. I was talking through mobile phone 5. Mechanical failure of the car 6. The car was very old 7. The road was crowded 8. I was chewing chat while driving 9. I was drunk alcohol 10. I haven't used a belt 11. Other reason specify it _____	
403	Were you accused by traffic police men in the last one year?	1. Yes ____ # 2. No	
404	If "yes" to Q403, what was the reason for accusation in the last incident?	1. High driving speed 2. Not used seat belt 3. Talking mobile phone 4. Alcohol drunk 5. Chewing kchat 6. Bypassing/breaking traffic 7. Not giving way or priority to pedestrians 8. Other reason specify it _____	
405	Do you think that road traffic accident in Adama is increasing?	1. Yes 2. No	

406	If you say “yes” to Q405, what do you think is the main reason for it?	1. Problem of licensing quality/skill 2. Drivers without license 3. Not obeying rules 4. Quality of the roads (overcrowding, broken road, Faded signs) 5. Problem of parking places 6. Improper use of road by pedestrians 7. Other reason please specify	

Annex-3- Oromigna questionnaire

Guca Heeyyamaa

Maqaan koo _____jedhama.Hojjetaa hospitaala Adaamaa yoon ta'u, amma proojeectii qo'annoo kanaatiif sassaabduu daataa ta'een tajaajila.Konkolaachistoota taaksii,baajaajii fi konkolaattota ummataa yoo xinnaate waggaa tokkof konkolaachisanin gaaffii afaanii gaafadha.

Odeeffannoon isin kennitanqo'annichi amala gadhee konkolaachisummaamagaalaa Adaamaa keessatti jiruu fii haalota balaa konkolaataa waliin wal qabatanaddan akka baasuuf sirriitti gargaara.

Isin kan filatamtan carraadhaan yoo ta'u,gaffiiwwan salphaa ta'anin isin gaafadha.

Gaaffiiwwan kun haala jiruu fi jireeny keessanii ,beekkumsa keessan,haala yaada keessaniifi wantoota balaa tiraafikaatiin wal qabatanof keessatti qabatu.

Maqaan keessan waraqaa oddeeffaannoo kan airratti hin barreeffamu.Oddeffannoon isin kennnitanis maqaa keessaniin wal hin qabatu.Odeeffannoon isin irraa argame hundi iccitiidhaan eeggama.Hirmaannaan keessan fedhii irratti kan hundaa'e yoo ta'u,gaaffii deebsuuf fdhii hin qabne akka deebistaniif hin dirqamtan.Gaafin kun daqiiqaa 20 kan fudhatu yoo ta'u,yeroo kamiyyuu yoo isiniif hin mijoofne addaan kuttaniidhiisuu ni dandeessu.

Yoo gaafii hin qabdan ta'e akkan itti fufuuf naaf ni hayyamtuu?

1.Eyyee (Galatoomaa! Akkan itti fufu naaf hayyamuu keessaniif mallattoo keessaniin mirkaneessaa!)

Mallattoo_____

2.Lakki(galatoomaa)

Guca Odeeffannoo Hirmaattotaa

Lakkoofsa koodii hiraattotaa_____

Maqaan koo _____n jedhama

Narsii hospitaala Adaamaa yon ta'u,yeroo kanatti qo'annoo Aaddis Hordofaa barataa Yuunivarsitii Finfinneetti koollejii meedikaalaa fi fayyaatiin qo'atamuuf sassaabduu daataa ta'een tajaajila.Waa'ee qo'annoo fi isinis akkamitti akka filatamtan akkan isiniif ibsuuf xiyyeefannoo keessan akka naaf laattaaniif kabajaan isin gaafadha.

The study title: The Assessment risky driving behavior among public car drivers and factors associated for road traffic accident in Adama, Ethiopia

Faayidaa qo'anichaa

Bu'aan qo'annoo kanaa balaan tiraafikaa magaalaa Adaamaattii amala gadhee konkolaachisummaa waliin wal qabatee dabalaa dhufuu isaa naoonni akka hubataniif ni taasisa.

Kana qofa osoo hin ta'in fuula duratti balaa tiraafikaa magaalicha keessaatii hir'isuuf karaa ni bana.

duraa duuba hojii fi adeeffannoo

Waraqaa gaaffii fayyadamuun gaaffii .afaaniin isin gaafadha. Isinis deebii keessan isa qo'annicha fayyadu naaf deebistu.gaaffi fii deebii kanaaf daqiiqaa 20 gahaadha

Rakkoo fi bu'aa qo'annichaa

Qo’annoo kanaan wal qabatee rakkoon hirmaattota irra gahu baay’ee xinnaadha.Innis yeroo hojii isaanii keessaa daqiiqqaa 20 qofa fudhachuudha.kaffaltiin hirmaattotaaf kaffalamu hin jiru.Garuu bu’aa qo’annichaa irraa ni fayyadamtu.

Iccitii

Odeeffannoon isin nuuf kennitan iccitiidha.Odeeffannoon waa’ee keessanii addatti if a taasisu hin jiru. Bu’aan qo’annichaa hirmaattota hundaafuu akka walii galaatti.Waraqaan gaaffii maqaadhaan osoo hin ta’in koodiidhaani.

Mirga hirmaattotaa Hirmaannaan qo’annoo kanaa fedhii irrattii kan hundaa’eedha.Hirmaachuu fi hiraachuu dhiisuufis mirga guutuu qabdu.Hirmaachuf yoo murteessitanis gaaffi fii deebii addaan kuttanii dhiisuu ni dandeessu.

Waan addan kuttaniifis bu’aan isin dhabdan tokkollee hin jiru.Gaaffiin deebisuu hin barbaanne yoo jiraat deebii kennuu dhiisuu ni dandeessu.

Haala qunnamtii

Gaafoi yoo qabaaattan lakkofsa moobaayila yookan imeeyilii armaan gadiitiin qunnamuu dandeessu

Qo’ataan Aaddis Hordofaa
Lakk. Mobaayilaa 0921685881
Imeeyilii:addiswordofa@yahoo.com

Annex 4 questionnaires (oromigna)

1.Gaafii haawaasuumaa fi raga dhuunfaa

Lakk codii.	Gaffii	Debii
101	Yeroo ittfuffa meeqafmagala adamairaati konkoolataakan yknkan issan walfakatankonkolachistani jirtuu? …….	
102	Umrii debessaa?.....	1-jiddu wagga18 fi 32 2-jiddu wagga 32 fi 50 3-wagga 50 olii
103	Saala debissa?.....	
104	Heerumetee	1-heruume hinbeku 2-heruumee 3-adanfuunee 4-dutee/due
105	Sadarkaa barnnoota	1primary sadarkaa1-8 2.sadarka secondary 9-12 3-TVET-,.kooleejiiraa university
106	ammanteekee maal?	1-orthoddoxii 2-Musliima 3-protestant 4-catholic 5-kanberra
107	Heeyama konkolaachisuumaa qabdaa?	1 Eyeen 2 Lakii
108	Yeroo meqaa oftee konkolata?.....	
109	Konkollatan kun keetii? ..	1-Eyyeen 2- Kiiyya mite

110	Yeroo meqaa konkolata kun hojatee?....	Ogaa……..
111	Kaaeshi hamaam jiiaan argaata?	1-1500-2000ETH 2-2500-3000ETHB 3-olee 3000ETHB
112	Magaalaa keesatii haariitii hamamiitiin konkolaachiistaa?	1.35 km sa'aatii tokko keesatii 2.40 km sa'aatii tokko keesatii 3-40 km sa aati tokko oli

2Gaffii mallatoo traffikkaa-Deebii sirii ta'ee fildhu

201) Maalatoon Agressisu kuni maleene ?

A – Namooni milaan deemuu karaa kessaa senaa jiiru
B – daimaani keraa kessaa senaa jiraanni
C – kerraa kuttanni yo demaani manii barumssaa jiraa
D –nammini qaxxaamuraa jira .

202) Maalatoon Agressisu kuni maleene ?
A – kerraa tokottii galii
B – kerraa lemman kan diimmu ni dhiphetaa
C – kerraan dheeraa kan demmu ni dhumma
D – dandim traffic kun kerra tookon demmaa

203) Maalatoon Agressisu kuni maleene ?

A – kara tooko kandeemu kessa gellaa jiirta
B – konkolaaton durra kandursuu kane keetti
C – daandii mootoraa funduuraa jiraa
D – konkolanii gougoudane karra kennan suutaan irra demmeni dhaa

204) Maalatoon kan akeenaa karraa essatti ilaltaa ?

A – karraa marsataa
B – dandii motraa irretti
C – Dandii it marrrmersseni
D – Koonkolaata iti dhabanii

205) Maalatoon karraa moteraa qalamaa gaabaatee malinni ?
A – Boraa
B –Maqariisaa
C –Bulee
D – magallaa

206) Mlatoo ajjejii kenaan issan kamiini ?

A - kululee

B – raga sadii

C – Rogaa Afour

D – Bulee

207) Maaltoon an akanna bayeenane essati argaamaa jir

A - Dandii Mucuccaachisuu jiraa

B – Mana suphaa konkolata

C – Edoo konkolata ittin Rakeesaa ta ee

D – Riqichaa Jelaa

208) Maalatoon Agressisaa kuni malline

A – eddo gegaarsaa kenu jirraa

B – karaa sagalle gudaa qabuu

C – Karaa mucucaa qabu

D – dandiin kun balaa qaba

209) Malatoo kana essetti argittaa

A – dandii mana barmussa cheesisuu

B – Iddo taphaa itti gagefamuu

C – Konkolaata mana barmusaa itidhabatu

D – Eyeemaa millaa demuu qoffaa

210) Maalatoon Agressisu kuni maleene ?

A – Milaaffi biskelatti dhorkadha

B – Melaffi qoffa

C – Bisklettif qoffaa

D – Eymaa bisklettif melaff qoffaa

Firomsi

A	B
211 	**A** Karaan abbaa kalattii lamaa waan dhiphataa deemuuf of eegannoon konkolaachisi
212 	B- Fuul dura keetti sirrichaa ykn gara mirgaati karaan deemsisu waan siqunamuuf of eegannoon konkolaachisi
	C- Karaan walqunamu ykn walit dhufu waan siqunamuuf of eegannoon konkolaachisi

.

213

D- Karaan abbaa kalatti tokkoo ture yeroodhaaf kalattii

lamaan waan eeyyamameef of eegannoon darbi

214 

n

E- Karaan gara mirgaati goru waan siqunamuuf sarara gara keetii qabachuun of eegadhuu darbi . mirga

215- 

F- Wal dursuun hin danda'amu isa jeduuf isa dhumaa

-

216- 

G- Marfanni ykn addabaabaayiin waan siqunamuuf of

eegataa

konkolaachiisi

217 

H- Saanuun dhorgadha

218 

I- Gara bitaa ykn gara mirgaa qofaat konkolaachisi

219- 

-	
220-  konkolaac	J- Karichi waan mucuceesuuf of eeggannoon
221- 	K- Kara mirga naananii dhabachuu qorkadha
222- 	L- Jarsollin mangudota kara galani jiruu
. - 223 	M- Naannoo daa’iman itti taphatan waan ta’eef of eegannoon konkolaachisi konkolaachisi
224 	N- Gara fuul-duraa ce’uumsi deemtotaa jiraachuu isaa agrsiisu
	O- Gara bitaati deebi’uun (guroon)

225-	P- Disabled persons parking_____
226 	Q- Kara deemtotaaf asiin darbun
227- 	R- Hospitaalli jiraachuu isaakan ibsu
 228-	S- Konkollata dhabuun dhorgadha
229- 	T- Sa’aa tokkon 30 km qoffaa dhoowadha
230- 	

3-Gaffii amalaa Konkolaachisuuaa

Codii lakk	Gaffii	Debii
301	1. Konkolachiisaa siilkii niduubiistaa?	1- yeen 2- indubisuu
302	Gaafii 301ffaf deebiin kee eyeen yoota'ee, maaliif?	1- Namnii biilbiilee maamiila ta'uu danda'aa 2-karshii kiyya dhisuu hinbarbadu 3gargaran barbadamun taa 4-kanbiraa hojiraatee debisii ……..
303	Gaafii 301ffaf deebiin hindubissu yoota'ee, maaliif? Dhuugaatii alkoolii ni fayadamtaa?	1- Seeraan ni adabsiisa 2- Tiiraafiikaa poolisii yoo na argee na adabsiisuu danda'a 3- Konkolachisa kiya adan citaa 4- Kanbira hojiratee debisii….
304	Alcholii nigudha/?	1-eyyen 2-hinkamu

305	Gaafii 304 ffaf deebiinkee eeyeen yoo ta'ee	1-yerro hundumaa Konkolaachisaa durra 2-yerro took took Konkolaachiisuu kotiin duura 3-Eergan konkolaachisee boda 4-kanbira hojiratee debisi
306	Qabatto off eeganoo konkolaataa ni hiidhataa?	1-Yerro hunduma 2—yerroo took took 3-inhidhadhuu 4-kanbirra hojirratee dubissii...
307	Yroondhan hammame oofta konkolataa	…….km/hour debeekee dubadhu
308	Tamboo nixuxt?	1 eyyen 2-hinxuxu
309	Eyeen ho Jetee yome xuxaa	1- Yerro tokotoko isokonkolachisu nixuxa 2- Yero hunda konkolachisuun duran nixuxa 3-bodan xuxa 4-kanbiraa hojiratee debissi

310	Caatii niqamaataa?	1-eyyen 2-hinkamuu
311	Gaafii 310 ffaf deebiinkee eeyeen yoo ta’ee	1-Konkolaachisaa 2-Konkolaachiisuu kotiin duura 3-Eergan konkolaachisee boda 4-kanbira hojiratee debisi

4- **Informationii ykn barmusaaBallaa konkkollataa**

401	Balaa konkolaataa sirra gayee ykn namara geesiistee beektaa ogaa took kessa?	1-Eeyeen 2-Hinbeeku
402	Gaafii 401 ffaf deebiinkee eeyeen yoo ta’ee sababiin isaa maalfaadhaa?	1-Haaritii humnaa olii 2-Malattolee tiraafikaa karaa keesaa dhabamuun 2-Namoonii milaan deman serra tiraafiikaa waan hinkabajneef 4-Mobaayila hasofsisaa waanta’eef 5-Fireniin konkolaataa hinhojaneef

		6-Konkolaataan moofaata’uu 7_Dhiiphina karaa 8-Caatii qama’aa waanta’eef 10-Dhuugaatii dhuugee waananturef 11- kanbiraa hojiratee debisi…….

403	Woog tokoaa duran adabbii traff pooliisii sittiqonami jiruu.	1-eyeen 2-natihinkunamee
404	Gaffii 403ffaa fi eyeen hojeetee maaliif/	1-Haaritii humnaa olii 2-Malattolee tiraafikaa karaa keesaa dhabamuun 2-Namoonii milaan deman serra tiraafiikaa waan hinkabajneef 4-Mobaayila hasofsisaa waanta'eef 5-Fireniin konkolaataa hinhojaneef 6-Konkolaataan moofaata'uu
405	Akaamitee qalbeefaata ballaa konkollatan adamma kessatii itticimee jirraa/	7_Dhiiphina karaa 8- kanbirra hojiratte debi keeni 1-eyyen 2-lakii

406	Gaffii405ffaafii eyeen hojeetee malliif	1-rakoo licencii keenaa 2-konkoolaanchistoon mallato licencii hinqabne 3Traffikka sera hinfudhan 4karran konkolaatan bayyee fafeeykn quqlitty hinqabuu ykn overcrowded wan taef 5-iddon konkollataa kan itti eejetu hinjiru 6-seeraa dhbuu nammoni kan milla demmanii 7-kanbiraa hojirratee dubadhu……..

Annx-5 Bio- Data Dr Naod Firdu

1-Bio-Data

Naod Firdu, Gizaw *(April, 2016)*

Personal Information:

First name: Naod Firdu

Last name: Gizaw

Sex: Male
Date of birth: 12-Aug-1987
Place of birth: Addis Ababa, Ethiopia

Marital status: Single

Nationality: Ethiopian

Language: Amharic and English: Speak, Read and Write

Phone number: +251910-20-48-88

Email: naodfirdu@gmail.com

ngizaw1@jhu.edu

Home Address:

House number 2662, Kebele 05, Woreda 03, Nifas-silk lafto sub-city, Addis

Ababa, Ethiopia

Tel: +251-113-710327

Office Address:

Lideta sub-city, Addis Ababa University, College of Health Sciences, School of Public Health

Tikur Anbessa Specialized Referral Hospital, Main building, 2nd floor, Room number c216

P.O. Box: - 5657

Tel: +251-115-157701

2 Education and Training

1. **HIV Implementation Research Fellow ship**

   Period of study: Since Oct 2014 till now

Program: Fogarty HIV Research Fellowship Program

Institution: Johns Hopkins Bloomberg School of Public Health, Baltimore, Maryland, USA

2. **Masters of Public Health (MPH) in Epidemiology**

Period of study: September 2012- July 2014

Program: Masters of Public Health, Epidemiology Specialty Track

Institution: Addis Ababa University, School of Public Health, Addis Ababa, Ethiopia

3. **Degree of Doctor of Medicine (MD)**

Period of study: January 2006-September 2011

Program: Medicine

Institution: Addis Ababa University, School of Medicine, Addis Ababa, Ethiopia

Trainings

- Responsible conduct of Research, Johns Hopkins Bloomberg School of Public Health, 2014.
- PMTCT training from AAU & John Hopkins University/TSEHAI project, March, 2011.
- International Training Workshop on Grants Management & Research Administration, Nairobi, Kenya by National Institutes of Health (NIH).
- ART & HIV care training from AAU School of Medicine & WHO, August 2011.
- The international conference on AIDS and sexually transmitted diseases in Africa (ICASA) 2011
- World Public Health Conference, 2012
- Training on "Understanding and Using the Demographic and Health Surveys" Measure DHS, August, 2012
- Ethiopian Public Health Association 25th Annual Conference, Feb 20 -22, 2014, African Union, Addis Ababa, Ethiopia
- MDR/XDR TB management training from Ethiopian Society of General Medical Practitioners and USAID, September 2010.
- Emergency Medicine training for interns from AAU, September, 2010.

- BPR & Government policy training from Ministry of Health, September, 2011.
- TOT on Application of Behavior Change Communication Strategies for HIV/AIDS, by AAU-MARCH Project, Johns Hopkins University Bloomberg School of Public Health & the US CDC.
- Research Ethics, Addis Ababa University, College of Health Sciences IRB in collaboration with MEPI
- Reproductive Health Commodity Security, Addis Ababa University School of Public Health in collaboration with UNFPA
- Ethiopian Medical Association (EMA), 51st Annual Medical Conference, Feb, 2015

3 Experience in years

(Addis Ababa University staff for the last 5 years)

3.1 Teaching and training

- Advise undergraduate medical and other health science students of Addis Ababa University on their research activities during rural community health attachment
- Lecture graduate students of Public Health and Epidemiology on Basics of Epidemiology, Observational Epidemiology, Interventional Epidemiology, Substantive Epidemiology and Research Methodology courses at the School of Public Health, College of Health Sciences.
- Lecture undergraduate medical, pharmacy, anesthesia and other health science students on Epidemiology and Research Methodology courses
- Lecture undergraduate medical students of Myung Sung Medical College (MMC), on Reproductive Health Courses and Research Methodology courses

Lecture public health, doctor of dental medicine (DDM) and other undergraduate health science students

- Train members of Addis Ababa University academic staff on ***"Basics of Research Ethics"***; organized by the IRB of the College of Health Sciences and Medical Education Partnership Initiative (MEPI), Aug, 2015.

Advisees

Primary thesis advisor,

Tariku Tesfaye MPH student, Addis Ababa University

Currently: Graduated

Addis Wordofa MPH student, Addis Ababa University

Currently, in progress

Markos Gobena MPH student, Addis Ababa University

Currently in progress

Birra Abdulkerim MPH student, Addis Ababa University

Currently in progress

And many others

Thesis co-advisor,

Mahelt Mekonnen MPH student, Addis Ababa University

Experience

Assistant Professor of Public Health and Epidemiology

Duration of employment: July, 2014 till now

Institution: Addis Ababa University, School of Public Health, Addis Ababa, Ethiopia

Lecturer

Duration of employment: September, 2011 – June, 2014

Institution: Addis Ababa University, School of Public Health, Addis Ababa, Ethiopia

Clinical Intern

Duration of Employment: July, 2010 – July, 2011

Institution: Tikur Anbessa Specialized Referral Hospital

3.2 Administrative positions held

Coordinator, Zeway Rural Community Health Program:

- a college wide undergraduate rural community health program

3.3 Other professional experiences

Clinical Works

- Worked as a clinician in the pediatric department of Anania Maternal and Child Clinic, Addis Ababa, Ethiopia
- Clinical practice in the private wing of Tikur Anbessa Specialized Referral Hospital
- Clinical practice in other private health facilities

Professional Associations Memberships

- Ethiopian Medical Association (EMA)
- Ethiopian Public Health Association (EPHA)
- Ethiopian Society of General Medical Practitioners (ESGMP)

Consultancy services

- Maternal and Neonatal Health in Ethiopia Initiative (MaNHEP) a project on Amhara and Oromia regions of Ethiopia: Involved on the end line survey
- For the “Adolescent Cohort Study in Ethiopia”; CIPHER grant; Ethiopian Medical Association (EMA)

Merits received

- Co-PI in a research award by Addis Ababa University-Medical Education Partnership Initiative (MEPI)
- Completion of **Internship** in four clinical departments (Internal Medicine, Surgery, Pediatrics and Obstetrics & Gynecology), **all with an 'A' level assessment**
- Ethiopian General Secondary Education Certificate with **4.00 GPA** (9As)
- Ethiopian Higher Education Entrance Certificate with **Very Great Distinction**

4 Major engagements (committees assignments) in University affairs

- Academic Commission Member of the School of Public Health at Addis Ababa

University

- Morbidity Analysis Technical Work Group for Tikur Anbessa Specialized Hospital; committee member
- Member (reviewer) and Secretary of the Research and Ethics committee (REC) of the Department of Preventive Medicine at the School of Public Health, Addis Ababa University
- Member of the managing committee of the ***Butajira Demographic and Health Survey*** (One of the oldest demographic surveillance sites in Africa)
- "***Measurement of Health and Diseases***" module for undergraduate medical students; Principal Module developer and coordinator

5 Publications and research experience

- *Gizaw M, Harries A D, Ade S, Tayler Smith K, Ali E,* ***Firdu N****, Yifter H.* Diabetes mellitus in Addis Ababa, Ethiopia: admissions, complications and outcomes in a large referral hospital, **Public Health Action**, March 2015, volume 5, number 1, pp. 74-78(5)

- "**HIV-infected adolescents have low adherence to antiretroviral therapy: a cross- sectional study in Addis Ababa Ethiopia".** *(accepted for publication on Pan African Medical Journal)*
- High mortality of mechanically ventilated patients at the largest tertiary referral hospital in Addis Ababa, Ethiopia: A retrospective chart review *(under review)*
- Prevalence and risk factors of diabetes mellitus and impaired fasting glucose among federal police members in Addis Ababa, Ethiopia
- Assessment of risky behavior among HIV infected adolescents in Addis Ababa, Ethiopia
- Maternal employment and breast feeding practice among women working in teaching hospitals of Addis Ababa University, Addis Ababa, Ethiopia
- Assessment of prevalence and associated factors for oral cancer among patients visiting radiation therapy at Tikur Anbessa Hospital, Addis Ababa, Ethiopia
- Substance use and other predictors of academic performance among undergraduate medical students of Addis Ababa University
- Assessment of Brest self-examination practice and associated factors among women attending selected health facilities in Addis Ababa, Ethiopia

References:

1. Dr. Wakgari Deressa; Dean of School of Public Health, Addis Ababa University deressaw@gmail.com
2. Dr. Getnet Yimer; Director for Research and Technology Transfer, College of Health Sciences, Addis Ababa University getnetyimer@gmail.com

Annex-6

Bio Data Addis Wordofa (dec 2016)

CONTACT INFORMATION

Name Addis Wordofa Tekele

Address Adama Ethiopia

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addiswordofa30@yahoo.com

PERSONAL INFORMATION

Date of birth 19 July, 1966 E.C

Place of birth Debrezeit of East Shewa, Ethiopia

Citizenship Ethiopia

Sex: Male

Marital status -Divorced

EDUCATIONAL BACKGROUND

Diploma	**Provider**
MPH candidate	Addis Ababa University (Currently)
BSc Degree in public health officer	Jima University 2009 EC
Diploma in Mid wifery	Gondor College Medical Sciences 2000EC
(certificate) in teaching at Debrebirhane	Debrebirhane teacher training Institute 1988
From grade 9-12	High school at Adama Gelawdiwose Vocational and Technical School in Adama /Nazareth/
From grade 1-8	No 3 Elementary and seconday school in

	Adama/Nazareth/

EXPERIENCE

Generally I have 16 years working experience in the ministry of health and Ministry of Education at different level, to list some:

- I have worked at the level of teaching in Ministry of teaching for 5 years
- I have worked at the level of Diploma in Midwifery in Ministry of Health as clinician for 5 years
- As public health office I have worked in Asella School of Health and Hospital at ART clinic and teaching staff the last 6 years.
- Currently I am a candidate of MPH in Reproductive health in Addis Ababa University.

TRAININGS

Training title	**Training provider**
Effective teaching skill	Ethiopia Midwifery Association
Effective teaching skill in advance for higher institution	Adama University
Basic and Comprehensive Obstetric Care	Asella Hospital
Maternity Care	Asella Health Biro with MOH
Short Course on Reproductive Health Commodity Security Addis Ababa, Ethiopia	Addis Ababa University andUNFPA
TOT on Integrated Childhood Illness	Jimma Univercity

SKILLS

Computer Skills

- Good at Microsoft, Excel, Power-point
- Internet related tasks

Language Skills

- Good at listening, speaking and writing English
- Excellent at listening, speaking and writing Amharic
- Good at listening, speaking and writing Oromifa

References - Dr Naod Fiedu Addis Ababa University , Addis Ababa Phone number: +251910-20-48-88

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