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Predictors of intrinsic motivation behind seatbelt use in a country where current use is low

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KEYWORDS

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ABSTRACT

Context: Seatbelt use is a major determinant of a driver's safety on the road. In Turkey and other middle-income countries, seatbelt use is lower than in high-income countries and contributes to the higher burden of road traffic injuries. Assessing factors behind drivers' motivations to wear seatbelts can help determine appropriate interventions for specific subpopulations.
Objective: To analyze the factors predictive of whether drivers who wear seatbelts in Afyonkarahisar and Ankara, Turkey do so because they believe seatbelts can save their lives.
Methods: As part of the monitoring and evaluation of the Bloomberg Philanthropies Global Road Safety Programme, 817 drivers were randomly recruited in Afyonkarahisar and Ankara, Turkey, to participate in roadside interviews. Logistic regression was run on data from 408 drivers who claimed they always wore seatbelts. Predictors were driver's city, driver's age group (30 and younger, 31 to 40, and over 40 years), whether at least one passenger was in the car, and an interaction term between age group and whether passengers were in the car. The outcome variable of interest was whether drivers wore seatbelts because they believed seatbelts can save their lives, referred to in this paper as "selection of Reason 3."
Results: The odds of selecting Reason 3 were 2.45 (95% CI: 1.40-4.31) times higher in Ankara than in Afyonkarahisar, 2.52 (95% CI: 1.38-4.60) and 3.65 (95% CI: 1.92-6.95) times higher for drivers aged 31-40 and drivers over the age of 40 than for drivers 30 years of age and younger, respectively, and 5.89 (95% CI: 2.02-17.23), 7.22 (95% CI: 1.61-32.42), and 0.83 (95% CI: 0.32-2.19) times higher for drivers traveling with passengers who were 30 years of age and younger, between 31 and 40, and over 40 than for drivers traveling without passengers in these age groups, respectively.
Conclusion: Drivers with passengers had higher odds of selecting Reason 3, especially younger drivers who are more likely to succumb to peer pressure. Older drivers had higher odds of selecting Reason 3. Peer groups and peer education campaigns may have an impact. Education interventions combined with extrinsic campaigns can be aimed at younger drivers to increase and maintain adherence in the population.

Introduction

Currently, road traffic injuries (RTIs) are the 8th leading cause of death across the globe; by 2030, it is estimated that RTIs will be the fifth leading cause.[1,2] Low- and middle-income countries (LMICs) account for a disproportionate burden of RTIs.[1,3,4] Middle income countries suffer the highest burden of road traffic fatalities, with a current rate of 20.1 per 100,000 population.[2]

In the WHO European Region (EUR), RTIs accounted for approximately 3.7 million disability-adjusted life years (DALYs) lost, 129,000 deaths, and 2.4 million injuries in 2004, making it the 6th leading cause of burden of disease in that year. LMICs suffered the heaviest burden, accounting for 70.5% of the region's RTI-related fatalities;[1] within EUR in 2010, RTIs were the 24th leading cause of death for Western Europe, the 17th for Central Europe, and the 10th for Eastern Europe.[5,6] In 2004, the first National Burden of Disease Study was conducted in Turkey, which is one such Eastern European middle-income country. This study found RTIs in Turkey accounted for 2.0%, 2.4%, and 3.8% of fatalities, DALYs, and years of life lost (YLL), respectively, in 2004.[6,7] Furthermore, in 2000, approximately 8000 deaths occurred due to RTIs; these deaths along with the 318,401 years of potential life lost (YPLL) cost Turkey U.S. $2.6 billion due to productivity losses alone.[8]

The ability of seatbelts to save lives has been confirmed by a study that revealed 830 of 1000 drivers who die in RTIs do not wear seatbelts and another that showed seatbelts can reduce injuries following RTIs by up to 77%.[1,9] In EurB, the WHO sub-region to

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which Turkey belongs, most RTIs victims are occupants of four-wheeled vehicles, which often offer seatbelts for said occupants' protection.[10] Drivers and passengers in Turkey and other LMICs are less likely to wear seatbelts than drivers and passengers in high-income countries.[2,11] Interventions designed to encourage seatbelt use have been shown to be cost-effective and useful in a variety of countries, assuming they are implemented according to knowledge of what will influence drivers.[12-17] Although studies have been conducted that demonstrate factors determining whether an individual is likely to wear a seatbelt,[18-29] there is still a deficit of studies specifically analyzing drivers' motivations for taking such actions. There is consensus amongst road safety analysts that individuals' particular driving styles depend on multiple types of motivation.[30-32] One basic distinguishing factor between types of motivation is whether it is intrinsic or extrinsic. An intrinsic motivator is one internal to a person; the reward of this motivation is the motivation itself.[33] An extrinsic motivator, as stated in Ryan and Deci, 2000, is one that motivates "because it leads to a separable outcome".[33]

The concepts of intrinsic and extrinsic motivation have been used in road safety studies and interventions in various countries, including Turkey, and amongst particular subpopulations such as children.[32,34,35] Advances have been made primarily in Afyonkarahisar ("Afyon"), Turkey using extrinsic motivators such as tickets and fines.[6] As predicted by Şimşekoğlu, however, these methods are only temporary and match the level of effort put into them.[36] Without continued enforcement and some other type of motivator, extrinsic motivation can only improve seatbelt use to a certain degree.[6,16,36-40]

Extrinsic motivators appear to have a ceiling. It seems intrinsic and near-intrinsic motivators, such as seatbelt use as a force of habit or a safety mechanism, serve as stronger motivators of the behavior for Turkish citizens.[36,41] New programmatic aspects in Turkey have reason, therefore, to intervene with intrinsic motivators in addition to legal repercussions. This study aims to analyze the predictors determining whether a driver will be affected by intrinsic motivators in Turkey. This analysis can help determine what groups of people to target with safety campaigns focusing on intrinsic motivations for seatbelt use in Turkey and other middle-income countries. This study is based on data from the Bloomberg Philanthropies Global Road Safety Programme in Turkey.[42-44]

Methods

Roadside interviews for seatbelt use were conducted in October, similar to previous studies in Turkey.[45] Drivers were approached and randomly recruited from car parks, shopping centers, and other suitable locations (i.e., places where researchers could observe drivers before they parked their vehicles) in the cities of Ankara and Afyon to participate in roadside interviews. Trained researchers described the aims of the Global Road Safety Programme, content of the interview, and the approximate duration to prospective interviewees and requested informed consent. If the driver consented, the interviewer asked a total of 22 questions concerning seatbelt use, child restraint use, and drivers' demographics; interviewers also recorded their own observations regarding certain aspects of the interview and characteristics of the interviewee. A standard questionnaire and protocol adapted from the WHO manual on seatbelts was used for these interviews.[46] A debriefing form summarizing the aim and content of the interview was given to every driver following his or her interview as per METU's ethical guidelines. These interviews were conducted over multiple time segments during the daytime hours of 08:00-17:00 on all days of a week in Ankara and on Saturday and Sunday in Afyon.

In the interview, drivers were asked if they always wore a seatbelt. If they claimed to always wear a seatbelt, they were asked why and told to select as many answers as pertained from the following:

Reason 1: It's the law
Reason 2: Police can fine me if I don't
Reason 3: It can save my life
Reason 4: The car will not stop beeping if I don't

Drivers could also select "Other Reason" and provide another reason.

Self-reported seatbelt use was used rather than observed seatbelt use. This study only utilized individuals who always wore their seatbelt, and the question "Why do you always wear a seatbelt?" was only asked of interviewees who claimed they always wore a seatbelt. Therefore, had observed seatbelt use been utilized, not all interviewees in the analysis would have given an answer for the outcome variable, and the resulting mismatch would have reduced the power of the study. Selection of Reason 3 was used as the outcome variable for analysis as the fact that seatbelts can save lives is one of the most common benefits of seatbelt use reported by drivers in Turkey and can therefore be used as a proxy measure of intrinsic motivation to wear a seatbelt in this study.[36,41] Two logistic regression models were estimated using several possible predictors and confounders. These variables were selected based on previous evidence from the literature, comparative Akaike's Information Criteria (AIC) values, and whether the coefficients had less than 10% data missing or otherwise unclassified. The first model included three main variables: city in which the interview was conducted,[18,27,28,47] driver's age,[18,26] and whether the driver had at least one passenger in the car.[18] It included variables to control for driver's level of education,[18,26] driver's gender,[19-22] whether the driver had been involved in an RTI in the past,[48] whether the driver had received a traffic violation in the past,[29,49] and speed limit of the road by which the interview was conducted.[50] To ensure an even distribution of individuals within each age category and minimize selection bias, age was transformed into a categorical variable with three categories: 30 and younger (i.e.; younger than 31), between 31 and 40, and older than 40 for use in the model. The second model was identical to the first but included an interaction term generated to model the way in which the change in odds of selecting Reason 3 when at least one passenger was and was not present in the car differed over the three age categories.

The first model was only used to analyze the effects of age and whether at least one passenger was present independently of the interaction term; the second model was used for the remainder of the analysis. Overall chi-squared tests and Wald tests for each variable were conducted to determine if the model and the coefficients were significant at the p=0.05 level.[51,52] The hot deck function for imputation of missing values was used to confirm that model fit was not significantly changed when imputed values were included to replace missing information. With no significant changes, the simpler model was favored (i.e., the one without imputed values).

Population characteristics were calculated and compared across outcome categories (i.e., selection of Reason 3 or no selection of Reason 3). Chi-squared tests and Wald tests were used to compare binary and categorical variables across the two outcome categories, respectively. Odds ratios and confidence intervals for the different effects of whether at least one passenger was present in the three age groups were calculated using a combination of the logistic regression model and Stata's lincom function.[53] Probabilities for the likelihood of selecting Reason 3 were calculated from the odds ratios using Inlow's methods.[54] All data analysis was conducted using Stata Data