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The Role of Economy in Taxi Drivers' Safety: A Qualitative Study

Mahsa Mehri [a] | **Maryam Khazaee-Pool** [b] | **Shirazeh Arghami** [c,*]

[a] *Department of Health, Safety and Environment Management, School of Public Health, Zanjan University of Medical Sciences, Zanjan, Iran.*
[b] *Department of Health Education and Promotion, School of Public Health, Zanjan University of Medical Sciences, Zanjan, Iran.*
[c] *Department of Occupational Health Engineering, School of Public Health, Zanjan University of Medical Sciences, Zanjan, Iran.*

***Corresponding author:** Shirazeh Arghami
Department of Occupational Health Engineering, School of Public Health, Zanjan University of Medical Sciences, Zanjan, Iran, 45157-86349. Tell: +98-9121909978.
E-mail address: arghami@zums.ac.ir

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ABSTRACT

Background: Economic pressures are important factors contributing to accidents. Despite the importance of economic factors in the safety of taxi drivers, a few literatures have referred to these factor.
Methods: This research was a phenomenology study. The purposive sampling was used, so, 18 taxi drivers with the average 43.05 ± 10.22 years old participated in the study of whom, 12 took part in individual in-depth interviews (IDIs) and 6 participated in a focus group discussion (FGD). The Bengtson's method (2016) was adopted to analyze qualitative data using content analysis.
Results: Two themes interlacing the impact of taxi drivers' Economic pressure on their safety were identified. The themes referred to taxi drivers' occupational expenses and livelihood concerns. Each of the themes were consisted of two categories, namely competition for passenger, taxi-keeping expenses and stability, adequacy of income, and undesirable household economic conditions, respectively.
Conclusion: This study showed the significant impact of economic pressure on the safety of taxi drivers as participants repeatedly reported unsafe driving behaviors in order to increase income. They also stated that issues such as unemployment and inflation caused many people to enter this occupation which led to dangerous competition over passengers and subsequent aberrant driving behaviors.

1. Introduction

Approximately 1.2 million people die in road crashes and 50 million are injured annually. However, this burden of traffic deaths has been distributed unequally across the regions of the world. Nearly 90 percent of traffic deaths occur in low and middle-income countries, with only 20 percent of the world's vehicles. Regional differences in traffic deaths even among EU countries are significant. For example, in 2007 traffic deaths for every 100,000 vehicles in Norway was 7, while in Poland it was 29.

Previous studies have shown that economic conditions - especially per capita income - play an important role in the rate of traffic deaths in a country [1].

In a study by Gaygısız (2010) among 46 countries, per capita gross domestic product (GDP) was negatively related to traffic deaths [2]. Different studies all refer to the importance of per capita income when considering the factors associated with traffic deaths in a country.

In addition to GDP, Gaygisiz (2009) examined the impact of other economic indicators, including Gini index and unemployment, on traffic deaths.

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He stated that in addition to GDP, unemployment is an indicator of the country's social and economic power, and the Gini index reflects economic inequalities, so it may affect the safety of a country's traffic.

The results of the Gaygisiz's study showed that GDP had a strong negative correlation with traffic deaths. Gini's index also had a significant relationship with traffic deaths, indicating the fact that the high death toll in a country may be related to the uneven distribution of resources in that country. Unemployment was positively correlated with traffic deaths in the studied countries. Hence, the results of this study showed that economic conditions have an important relationship with traffic deaths [1].

Although the economy may not directly impact the number of traffic deaths, but it affects almost all of its associated factors, such as mobility (number of people driving) and safe behaviors (the amount of costs people spend on safety). That's why Özkan and Lajunen (2007) stated that, in addition to the traditional triple E for the prevention of injuries (i.e., engineering, law enforcement and education), the economy should be added as the fourth E factor to preventing road traffic crashes [3].

Inflation and unemployment are key negative indicators of Iran's economy. Moreover, the young population of the country impose a double burden on the labor market. Such that, the youth unemployment rate was 25%. Official statistics suggest that 40% percent of university graduates have not been able to find jobs in their specialized fields, and inevitably engage in other works, which is called "underemployment". Another key challenge to Iran economy is high inflation. Despite the government's efforts to reduce its inflation rate that was nearly 42% in May 2013, the inflation rate still remains high in the society [4]. In addition, per capita income in Iran is very low, which is estimated at $ 900-1000, that is less than a quarter of the average income in North America and a third of the average income in Western Europe. All of these evidences are indicative of downward economic condition of Iran [5].

The impact of economic problems on drivers' behaviors, especially professional drivers, is very important given the current economic crisis in Iran. Among professional drivers, taxis are very popular in many developing countries and trigger many traffic accidents, however, a few researches has been done on taxi drivers, and many of these existing studies have also been carried out in developed countries [6]. It can be said that taxi drivers are more exposed to traffic accidents due to their higher occupational exposure to the road dangerous environment [7]. Taxi drivers often work in dangerous and stressful situations, including long working hours, frequent driving duties, and sometimes occasional discrepancies with passengers. It is clear that the daily revenues of taxi drivers depend on driving distances and their working hours. Subsequently, they must devote more time to driving daily and carry the largest possible number of passengers in order to increase their income. Therefore, it is not surprising to repeat the dangerous occupational behaviors while driving. Indeed, since drivers' revenues are dependent on the number of passengers transporting, they tend to drive at a high speed so as to save time and carry more passengers, which can lead to committing more driving violations [8].

Economic pressures are important factors contributing to taxi drivers accidents. Drivers who do not have enough income to support their families may be able to prolong their working hours to increase their income or engage in dangerous driving behaviors, which may end in road traffic accidents [6]. Despite the importance of economic factors in the safety of taxi drivers, a few literatures have referred to this factor, and most of the studies on taxi drivers' safety have focused on aspects such as taxi drivers' fatigue, compliance with traffic laws [8-11], the use of seatbelts of taxi drivers and so on. Most of which have addressed the behavioral and physical risk factors [12,13]. As a result, there are a few reports on the root causes of these behaviors, including the experiences of taxi drivers under certain socioeconomic conditions. The lack of information on the sensory experiences and cognitive meanings of taxi drivers about socioeconomic issues may make it difficult to understand the risk factors, which may contribute to accidents among taxi drivers. This study uses a phenomenological approach to explore opinions and lived experiences of taxi drivers about the impact of economic factors on their driving behaviors.

2. Materials and Methods

2.1. Research design

This research is a phenomenological qualitative study used to explore the experiences and attitudes of taxi drivers in order to understand the socio-economic factors affecting traffic safety in taxi drivers. The phenomenological research is aimed at describing the lived experiences of the participants, hence it seems an appropriate method for this study. Creswell states that the phenomenological study describes the meanings of individuals about their lived experiences in relation to a concept or phenomenon. The main purpose of phenomenology is to transform the personal experiences of individuals in relation to a phenomenon into descriptions of the universal essence [14].

In this study, phenomenological approach was adopted that focused less on researcher interpretation and focused more on the participants' descriptions of their experiences. The procedures of this approach include identifying the phenomenon studied, collecting data from individuals who experienced this phenomenon, and then analyzing the data with the aim of reducing the information to important statements or quotes and combining these statements in the form of themes [15].

2.2. Recruitment and participants

Participants were recruited by approaching Taxi Drivers' Organization in Zanjan. The purposive sampling was used to select 18 taxi drivers participated in the study of whom, 12

took part in individual in-depth interviews (IDIs) and 6 participated in a focus group discussion (FGD). The participants were compensated by receiving a cash bonus equal to their working time spent on the study. Taking part in the study was quite voluntary, informants deliberately choose to participate in IDIs and FGD. The sociodemographic characteristics of the participants are shown in Table 1.

2.3. Data collection

As stated before totally 18 taxi drivers participated in the study. Two types of data collection methods were adopted for data gathering. At first the researchers did 12 individual in-depth interviews (IDIs), after reaching to saturation a focus group discussion (FGD) held to validate the data.

Table 1: Demographic characteristic of the participants

Taxi drivers			
Characteristics		**Number**	**Percent**
Age (years)			
	23-34	4	22.22
	35-46	7	38.88
	47-58	7	38.88
Education			
	Reading and writing	2	11.11
	Elementary school	1	5.55
	Guidance school	7	38.88
	High school	5	27.77
	University graduate	2	11.11
	University postgraduate	1	5.55
Working experience			
	2-10	6	33.33
	11-20	6	33.33
	20 <	6	33.33

2.4. A: Individual in-depth interviews

After passing training courses, the interviewer was assigned to the field of study and conducted interviews with taxi drivers. In order to gain the trust and participation of interviewees, the researcher emphasized that there was no "right" or "wrong" answer. Participants were told that they would leave the interview at any time when desired. Taxi drivers were assured about the confidentiality of the responses, providing opportunity to express their views about the role of economy in their driving behaviors freely.

Interview sessions were held in a private room free from any distraction with only the researcher and the interviewee attending. Prior to the start of the interviews, all participants filled out informed consent forms. The duration of IDIs varied from 22 to 87 minutes (mean = 72.77 min). All interviews were recorded with the permission of the participants, then the researcher attempted to transcribe the data. At the end of the study, the saturation was achieved and the sampling process was stopped.

2.5. B: Focus group discussion

A focus group discussion conducted to validate the themes that emerged from IDIs. In the FGD, 6 taxi drivers took part and the interview lasted 110 minutes. During the focus group, clinical interviewing techniques were applied, such as reflection, restatement, clarification, and exploration. Like the IDIs, interviews took place in a separate room where only participants and the researcher were present. The discussion was recorded and transcribed verbatim. The identifying details were removed and the transcripts were not shared with any organization.

2.6. Statistical Analysis

The purpose of data analysis in the phenomenological approach was to reduce information to important statements and quotes, and to combine statements in the form of themes. Hence, the use of content analysis for achieving to this goal seems appropriate [16]. In this study, the Bengtson's method (2016) has been adopted to analyze qualitative data using content analysis, which consists of four steps respectively: the decontextualization, the reconceptualization, the categorization, and the compilation [15].

In the first step, the decontextualization, the researchers became more familiar with the data. In this regard, transcripts of the interviews were studied several times and the researchers immersed in the data. Then these transcripts were broken into smaller meaning units. Meaning units are the smallest unit that incorporates some of the participants' views about the aim of the study. Then codes were assigned to each meaning unit, this step is known as "open coding" process in the literature.

In the reconceptualization step, after the meaning units were identified, the researcher examined whether all aspects of the content were covered in relation to the purpose of the study. For this reason, the transcription was re-examined and parts that were not selected as meaning units were re-reviewed so that no data that was related to the study would be hidden, and the redundant parts that were not related to the study's purpose were deleted.

In the categorization step, before the researchers began to create categories, the meaning units were condensed and coded.

To extract the essence of the data, codes were placed within groups and created subcategories, then subcategories were grouped into larger units called categories, and eventually these categories formed the themes. The categorization and data collection were done simultaneously, and double coding was applied by the, so that the researchers each performed categorization independently, and after changing the subcategories, categories and themes a lot of times, eventually, consensus was achieved among the researchers over the categorizations.

In the last step, after the data categorization, the process of analyzing and writing up the findings began. In presenting the findings, the researchers expressed quotes from the participants regarding the categorization performed. At this

stage, the researchers presented a summary of the themes, categories/sub-themes and subcategories/sub-headings in table 2, which provided a quick overview of the results. At the end, the researchers considered the findings of the study in various literatures to see if the results seemed logical and rational. The researchers also conducted a FGD to ensure data accreditation; all the themes derived from the IDIs were verified by the FGD [15].

3. Results and Discussion

The taxi drivers were 43.05 ± 10.22 years old on average, and on average had been in the profession for 13.72 ± 8.77 years. All of them were male because of specific sociodemographic characteristics of taxi drivers in the city.

Two themes interlacing the impact of taxi drivers' economic pressure on their safety were identified. The themes refer to taxi drivers' occupational expenses and livelihood concerns. Each of these themes were consisted of several categories and subcategories, which are shown in Table 2. In the following section, more detail is described.

3.1. Occupational expenses

Participants stated that the economic crisis in society as well as unemployment has caused more people to flee to a taxi driver's business or illegally carry passengers with their own private cars. The entry of this large number of people into this job on the one hand and the increase in the number of private cars and the reduction of people's willingness to use public transport vehicles on the other hand, has led to a shortage of passengers for taxi drivers. In addition to a lack of passengers and a small income for drivers, the high occupational expenses of taxi drivers were among the other issues raised during the interviews. Of the mentioned problems, the high taxi-keeping expenses and competition for attracting passengers can be noted. Participants declared that occupational expenses imposed heavy burden on taxi drivers and also caused dangerous driving behaviors, which in turn could negatively affect the safety of the drivers and passengers.

3.2. Competition for passenger

The low number of passengers has caused some serious competition among taxi drivers for picking up the passengers. Such competitions in most cases involved unsafe behaviors, such as increasing speed for picking up the passengers faster than the others, cutting off other motorists, picking up the passengers in any way possible on any part of the street, conflicting with their colleagues and unlicensed passenger-carrying cars and retaliating against each other aggressive driving, and etc. These dangerous behaviors, in turn, can have a significant impact on the safety of drivers, occupants and even other road users.

I can say that physiological calmness and safety of a taxi driver depend on having no concern about finding passengers. I mean that if a passenger stands 10 meters ahead of me, I should have no stress that someone would come and pick him/her up and because I am driving with that thoughts in my mind, I am not a safe driver. I just want to rush and wave through the crowd in order to catch up with the passengers. Especially during these last two years, in which taxi drivers and unlicensed passenger-carrying cars have increased, I have always driven with feeling concern about passengers, which is an important point in a taxi driver's safety."

"Sometimes it happens that there is passenger standing by the street and a taxi driver is driving behind me, as soon as he sees the passenger, he cut in front of me to stop me and picks up the passenger by his own, which is quite out of line."

Table 2: Themes, categories, and sub-categories of the study

Theme	Category	Sub-Category
Occupational Expenses	Competition for Passenger	Low number of passengers Moonlighting Unlicensed passenger-carrying cars
	Taxi-keeping expenses	Car insurance Fuel cost High monthly auto loan payment Car Technical Inspection cost Cost of renewal of CPV ID[1] card Maintenance cost
Livelihood Concerns	Stability and adequacy of Income	Income deficiency Income Instability Long working hours and Fatigue Low retiring pension
	Undesirable household economic conditions	Economic crisis Economic and marital problems Unemployment Living and family expenditure Failure to meet family financial needs

[1] Commercial passenger vehicle identity

Coping is one way to respond to stress. Some of the coping methods seem to be quite suitable and they are considered as positive strategies, but not all methods of coping are positive. There are some methods that are maladaptive. In maladaptive mechanisms, one uses a method to respond to stress, which causes the stressor maintains its strength or becomes more stressful [17]. The results of our study showed a high level of financial stress among taxi drivers.

Taxi drivers said they would commit traffic violations to increase their income and hence cope with the financial stress. This mechanism can be justified using other studies.

For example, De Coster (2005) introduced law violation as a way of coping with anxiety. Based on his study, it is likely that the problems will externalize in the form of antisocial behaviors and law violation, which may confirm the arguments of strain theories.

Classical strain theories describe the relationship between economic pressure and law violations [18]. These theories

examine the role of economic factors in disobeying the laws. At the individual level, researchers focused on factors such as socioeconomic status, economic dissatisfaction, and financial problems. Studies indicate that law violation is related to economic dissatisfaction and the experience of economic concerns. Such problems often affect employees and may describe the causes of committing law-violating behaviors [19].

Some studies have shown that the main variables in the classical strain theories, namely, the dissatisfaction with the economic situation, lead to income-generating violations [20]. Although classical strain theories are related to criminal violations, according to the results of our study, it seems that it might also be used to describe the violations in traffic domain too. However, in the study, the taxi drivers also saw traffic violations as a way of coping with their financial stress. But as stated, this way of coping must be considered a maladaptive mechanism, in which their driving violations will increase traffic congestion and chaos, decrease traffic safety, and, in turn, reduce taxi drivers' income and lead to more financial stress.

Htun et al. (2012) stated that public transport drivers in developing countries often take passengers at any possible place even at unauthorized locations. After taking a sufficient number of passengers, the public transport drivers start to drive at a high speed. The drivers often violate traffic laws [21]. Grimm et al. (2010) also argued that taxi drivers in low-income countries show a lot of unsafe driving behaviors. They are in time pressure to get more passengers to earn more income [22].

3.3. Taxi-keeping expenses

The other concern that expressed by the participants was heavy taxi-keeping expenses. Long working hours of taxi drivers as well as other existing issues such as traffic congestion and inadequate road infrastructure, low quality of cars, and etc., resulted in higher costs for vehicle maintenance, higher fuel consumption and more financial burden on taxi drivers. Moreover, participants reported other costs such as renewal of CPV ID, car technical Inspection, car insurance, and great interest rate of taxi loans, heavy monthly car payments, which caused them a lot of problems and ended up to anxious, psychological stress, higher working hours, further competition for passengers, more unsafe behaviors, and higher priority of income compared with safety and health for taxi drivers. Some participants also spoke about the reverse effect of the fines, and they knew it as a contributing factor in making the driver angry and causing harsher driving.

"*The taxi driver's income comes down, which get on their nerves ... With the staggering expenses such as car maintenance, and car insurance costs, we can't make ends meet. Most of the taxi drivers always are badly in dept with tire sellers, mechanics, auto upholstery, and front suspension repair specialists."*

"They say that we can get a cheap loan for buying a taxi, but the interest rate of these loans is 16, 18% with high monthly payment of 600 to 570 thousand toman ".

A study that conducted by Mayhew et al. (2006) on truck drivers revealed a negative relationship between economic pressure and occupational safety. The researchers observed that the major problems faced by the truck drivers, were economic and financial problems such as the costs of fuel, insurance, and registration, etc., financial issues related to the fright rates, low incomes, high competition. More than 85 percent of the drivers on Hume highway considered fuel, registration, insurance costs as a big problem. Hard competition had led to unauthorized loading, long and illegal working hours, which ended up to chronic fatigue, high stress, high competition and lower occupational safety for truck drivers in the European Union and North America [23].

Harsanyi (1966) identified economic payoffs as the most important motivation and stimulation of social behaviors [24].

3.4. Livelihood Concerns

Participants of the study referred to the stability and quality of taxi drivers' income in the community.

Participants stated that the economic crisis in the society as well as unemployment had a great impact on financial stability and status of taxi drivers. The economic crisis and unemployment had led many people to turn to illegal passenger carrying job, which led to a shortage of passengers and, moreover, influenced the stability and quality of taxi drivers' income. On the other hand, factors such as inflation in the society had affected the livelihood of households. Hence, the existence of economic and familial problems imposed a heavy burden on taxi drivers, which resulted in internal conflict, aggression, lack of concentration, inquietude, increased working hours, Fatigue, more competition for passengers, unsafe behaviors, and so on.

3.5. Stability and quality of income

Taxi drivers, expressed concern over issues such as inadequate retiring pension, income instability and shortages, long working hours, and fatigue. According to the participants declarations low retiring pension, resulted in working after retirement. Taxi drivers knew all of the mentioned issues as major factors affecting their safe driving behavior.

"*Why a taxi driver has to be behind the wheel for 14 hours? He gotta (have got to) do that because of the low income. His thoughts wander, safety won't be on his mind. Generally, 90% of all taxi drivers' financial income is very low ".*

"It (long working hours) makes him tired, the driver has to rush, moreover, getting stuck in the traffic exhausted him, he

feels pain in his feet, which makes him to jump the queue and change the line to the less crowded one and drive in the opposite direction. Or even it can cause him to forget about using turn signal and to stop wherever it comes ".

Sociological literatures have indicated that low relative income creates a sense of relative deprivation and, in turn, causes disappointment and anger among low-income people. A small relative income, in turn, can also lead to aggressive violations. Different literatures have shown that relatively low income has a negative impact on job satisfaction, happiness and well-being.

Economic theory states that the decrease in income has a positive and significant effect on the increase of violations. The economic model examines the relationship between one's income and violations. Economic theory states that the motive for committing violation depends on the expected net returns from these violations. The economic framework considers only the individual financial incentives for committing violations, in particular, income-related violations. From the point of view of the strain theories, people compare themselves with the wealthier ones, and reaching the belief that they are relatively more deprived than others, cause anger, frustration, and, in turn, end up to committing violations.

Niknami (2012) stated that with increasing incomes, the likelihood of a law violation decreases. And, based on empirical evidence, he shows that the extent of a person's violations depends more on the amount of income than on income distribution of a nation's residents [25].

3.6. Undesirable household economic conditions

Other controversial problem that revealed by the participants was bad economic condition of the households. As stated earlier, the economic crisis, inflation, unemployment caused a great number of people to turn to legal or unlicensed passenger-carrying job, which ended up decreased income for taxi drivers, inability to provide for their family, familial problems, and so on. The economic crisis and inflation had resulted in heavier living and family expenses, and the inability to meet the needs of the family, which exacerbated the financial burden on taxi drivers and has caused stress and psychological pressure, job dissatisfaction, as well as, long working hours, fatigue, competition for passengers and dangerous driving behaviors. "*For example, if one day the taxi drivers take sanctuary in front of the provincial government, to show their protest of illegal passenger-carriers, the next day the illegal passenger-carriers will convene there and say that they are unemployed and ask for a job ".*

"*If the taxi drivers' income gets low, it makes them fly into rage, despite plugging away to have the burdens at the door, financial pressures lead us to familial problems ".* "*In my look, if the burden of unemployment, economical, and living problems comes down, it will impact taxi drivers' safety by 100 percent ".*

Literatures suggest that, given the recession, the high unemployment rate in the society is unavoidable, which contribute to a rise in inflation in the community too. Looking at the findings of 63 articles on the relationship between unemployment and violation, Chiricos observed that there was evidence of a negative relationship between unemployment and violation, which could be a factor in supporting the positive impact of unemployment on violations of the law. They observed that the impact of unemployment on violations was more than the effect of the deterrent measures and argued that the effect of unemployment on violations seemed to be stronger than the effect of the probability and severity of the punishment on violations occurrence [26].

Veneziano et al. (1994) studied the stress-related factors associated with unsafe driving behavior among 498 people who were arrested for driving violation. The researchers looked at the kinds of stress that these offenders were affected when they were arrested. The offenders stated that at the time of the offense, they were affected by financial stress, work pressures, loss of job or unemployment, family problems and illness or death of loved ones. Different types of stress that were identified in their study were found to be important factors causing unsafe driving behaviors. The prevalence of stress due to job loss or unemployment, financial problems, family problems were respectively 40%, 38%, 35.5% among the offenders, which were similar to the types of the stresses that were reported by our participants. Stress often leads to aversive driving behaviors and is a major contributor to mental-behavior impaired control cycle (ICC), hence another factor in explaining the effect of stress on aberrant driving behaviors [27].

4. Conclusion

The results of the study showed the significant impact of economic pressure on the safety of taxi drivers as participants repeatedly referred to unsafe driving behaviors in order to increase their incomes. They also stated that issues such as unemployment and inflation caused many people to enter this occupation which led to dangerous competition over passengers. It seems that proper organizational planning to take into account the appropriate number of taxi drivers tailored to the needs of citizens and the increase of surveillance to prevent illegal passenger-carriers can somehow reduce the risk of dangerous competition among taxi drivers. On the other hand, considering facilities for taxi drivers, including spare parts for automobiles at a more affordable price, subsidies for fuel, and maintenance cost, can partly reduce the burden of financial pressures on them. In addition, providing lower interest rate of taxi loans and lower monthly payments for taxi drivers, can increase drivers' willingness to replace worn-out vehicles and lesson economic pressure. Long-term government planning is needed to reduce unemployment and inflation in the community, which can indirectly affect the safety of drivers.

Authors' Contributions

F.Gh., conducted the field work and wrote the manuscript; Sh.A., designed the study, analyzed the data and wrote the manuscript; M.M., conducted the field work; J.B., conducted the field work; Sh.Gh., conducted the field work. All authors revised and approved the final manuscript.

Conflict of Interest

The authors report no conflict of interest.

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