

Determinants of Bus Seat Belt Usage Behavior: A Qualitative Study

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Abstract

Seat belt use is one of the most effective behaviors for saving lives and reducing injuries in bus accidents. This behavior among Iranian bus passengers has not received enough attention. The aim of this study was to discover the determinants of the use and lack of use of bus seat belts in a sample of bus drivers and passengers, traffic police, and related experts. In this qualitative study, data were gathered through 60 semi-constructed interviews. A data analysis was conducted using the inductive content analysis method. A purposive and non-probability sampling approach was employed to recruit participants. After the data analysis, 493 primary codes were extracted, and multiple revisions and merging of these codes based on similarity were carried out. Two categories were identified as determinants of bus seat belt usage behavior. The results of this study provide a comprehensive view of the determinants of bus seat belt usage behavior in Iran and suggest the necessity of interventions in bus passengers' attitudes and perceptions and more attention to environmental issues, such as the appropriate availability of bus seat belts.

Keywords

Seat belt use; determinants; bus passengers; safety

Introduction

At present, public transit is more accessible, reliable, and efficient for passenger transportation than before. Passengers generally feel safe using public transport, especially bus travel. Traveling by bus is among the safest modes of transportation, and bus crashes do not happen very often. However, compared to other crash types, because these vehicles carry many passengers, the number of fatalities and injuries can be high, so bus crashes have become a major concern throughout most of the world (Barua & Tay, 2010; Guler, Atahan & Bayram, 2011). For example, bus accidents led to 13,417 injuries and 250 fatalities in the U.S. in 2009 and cause 30,000 injuries and 150 fatalities in Europe every year (Blower & Green, 2010; European Coach and Bus Occupant Safety Project, 2004; Bjornstig et al., 2005; The National Transportation Safety Board, 2012).

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Reducing mortality rates due to bus accidents is among the road safety aims of many countries, including Denmark, India, Thailand, Nepal, Tanzania, and Zimbabwe (Pearce, Maunder, Mbara, Babu & Rwebangira, 2000; Prato & Kaplan, 2014; Nambulee, Jomnonkwao, Siridhara & Ratanavaraha, 2019). Bus safety is regulated in the U.S. by the Buses in Fatal Accidents database (BIFA), which contains records of all the medium and heavy buses that were involved in fatal traffic crashes in the 50 states. In Europe, the European Coach and Bus Occupant Safety project (ECBOS) aims at making improvements in the current regulations and proposes new regulations and standards for the development of safer buses and coaches (ECBOS, 2004; National Highway Traffic Safety Administration, 2017).

Bus accidents are also a concern in Iran, where evidence shows that bus accidents kill and injure a large number of passengers each year (Table 1).

Table 1: History of bus incidents and accidents in Iran along with resulting casualties, 2013-2016 (Tasnimnews, 2017)

Location (year)	Type of accident	Result
Road of Karaj - Chalous (2016)	collision with electric column	15 killed, 11 injured
Tehran-Bushehr highway (2016)	overturn	36 injured
Road of Sirjan - Neyriz (2016)	fall into valley	15 killed, 8 injured
Road of Chamanbid - Golestan Forest (2016)	burning	2 injured
Road of Golestan - Galicash (2016)	collision with truck	1 killed, 7 injured
Road of Andimeshk (2016)	overturn	10 injured
South of Sistan and Baluchestan (2016)	overturn	4 killed
Road of Bojnourd (2016)	collision with light car	4 killed, 34 injured
Road of Hamedan - Tuysarkan (2015)	collision with a trailer	11 injured
Road of Arak - Qom (2015)	collision with a trailer	3 injured
Road of Miami - Sabzevar (2015)	collision with light car	No casualties
Road of Isfahan - Najaf Abad (2015)	overturn	2 killed, 31 injured
Road of Isfahan (2015)	collision with truck	3 killed
Road of Chabahar - Sarbaz (2015)	collision with a trailer	19 killed
Road of Isfahan - Yasuj (2015)	collision with truck	5 killed, 10 injured
Road of Karaj - Chalous (2015)	pile-up with light and heavy cars	1 killed, 7 injured
Road of Baneh - Tehran (2015)	collision with a trailer	6 killed
Road of Alborz (2015)	collision with truck and light car	25 injured
Road of Tehran - Mazandaran (2015)	overturn	11 killed
Road of Kashan - Natanz (2014)	collision with truck	10 killed, 10 injured
Road of Marvdasht - Shiraz (2014)	overturn	7 killed, 16 injured
Road of Hamedan - Kermanshah (2014)	collision with another bus	3 killed, 39 injured
Road of North Khorasan (2014)	collision with minibus	10 killed, 47 injured
Tehran - Karaj highway (2014)	collision with pickup truck	2 killed, 2 injured
Road of Islamabad - Hamil (2014)	collision with minibus	8 killed, 17 injured
Qom - Tehran highway (2014)	collision with light car	2 killed
Road of Mashhad (2014)	collision with light cars	50 injured
Zanjan - Qazvin Highway (2014)	collision with pickup truck	1 killed
Road of Damghan - Semnan (2014)	collision with a trailer	1 killed, 20 injured
Road of Tafresh (2014)	collision with road guard rail	16 injured
Road of Haraz (2014)	collision with truck	27 killed and injured
Qazvin - Zanjan Highway (2014)	collision with truck	30 injured
Road of Ardakan - Nayeen (2014)	collision with truck	1 killed
Road of Urmia - Mahabad (2013)	collision with light car	3 killed
Road of Damghan - Semnan (2013)	collision with a trailer	24 injured
Road of Gorgan - Tehran (2013)	overturn	19 killed
Qom - Tehran Highway (2013)	collision with light car	21 injured
Road of Kerman - Shiraz (2013)	collision with truck	1 killed, 27 injured

Location (year)	Type of accident	Result
Road of Quchan (2013)	collision with a trailer	8 killed, 30 injured
Road of Mazandaran - Savadkuh (2013)	collision with truck	3 killed, 33 injured
Kashan Highway (2013)	collision with truck	6 injured
Qom - Tehran Highway (2013)	collision with another bus	44 injured

According to the World Health Organization's 2015 report, 2% of the deaths from road accidents in Iran were caused by bus crashes (World Health Organization, 2015).

The seat belt is designed to apportion force to the harder parts of the body and to absorb the energy of accidents. This device restricts the movement of vehicle occupants during accidents and prevents serious injury. The role of seat belts in reducing injuries caused by traffic accidents has been proven. Statistics show, for example, that 44% of occupants killed in crashes while not using seat belts are partially or totally ejected from the vehicle (Evans, 1996; World Health Organization, 2015).

Seat belts reduce the risk of death by 45-50% for drivers and front-seat occupants and by 25-75% for rear occupants. In accidents, if the occupants are not wearing a seat belt, they continue at the speed the car was traveling and are likely to impact the windshield, instrument panel, steering wheel, or other occupants. It is possible that occupants will be thrown from the car. Seat belts prevent the occupants from being ejected from the vehicle (Elvik, Vaa, Høy & Sørensen, 2009).

The risk of severe injuries in bus crashes is dependent on whether or not the occupants use seat belts. A study by Chang, Guo, Lin and Chang (2006) reported that the use of seat belts could prevent or reduce the severity of injuries caused by bus crashes. Bus seat belts prevent occupant interactions, interaction with the interior of bus, and ejection in crashes.

Simulations of bus crashes show that unrestrained occupants risk being ejected or partially ejected and making contact with external objects during bus crashes (IMMI, 2017; RTV6 Indy Channel, 2017; News Today, 2017). Studies based on simulations indicate that the number of injured occupants and the severity of casualties decrease if the bus is equipped with a proper seat restraint system and belts are used (Mayrhofer, Steffan & Hoschopf, 2005). This evidence confirms the need for bus seat belts.

Previous studies have examined the factors associated with safety belt use. In a survey of 215 young drivers, Fernandes, Hatfield and Job (2010) found that BMI, drunk driving, and high-speed driving were independent risk factors for the non use of seatbelts in car drivers and passengers. Anderson & Mellor (2008) in another study measured risk preference through the lottery choice experiment and found that risk aversion is negatively and significantly associated with cigarette smoking and seat belt non-use when people drive cars. Several studies have shown a significant relationship between gender, age, drug use, drunk driving, speed limits, alcohol consumption, high-speed driving, and seat belt use for rear and front-seat occupants in different types of vehicles (except buses) (Dinh-Zarr et al., 2001; Lichtenstein, Bolton & Wade, 1989; Schlundt, Briggs, Miller, Arthur & Goldzweig, 2007; Takakura, Ueji & Sakihara, 2001).

Some factors that have been highlighted in various studies as the main reasons for not using seat belts include lack of belief in seat belt effectiveness; trust in the safety of the car; not having the habit of putting on a seat belt; and believing that seat belts are uncomfortable, restrict movement, and trap occupants in the vehicle during a crash (Begg & Langley, 2000; Cunill, Gras, Planes, Oliveras & Sullman, 2004; Dinh-Zarr et al., 2001; Edgerton, Duan, Seidel & Asch, 2002; Gras, Cunill, Sullman, Planes & Font-Mayolas, 2007; Routley et al., 2010). There are also some socio-psychological factors, such as attitudes, beliefs, and intentions, which affect seat belt use (Şimşekoğlu & Lajunen, 2008).

A review of related literature shows few studies focusing on seat belt use on bus passengers. One study by Nambulee et al. (2019) determined the factors influencing bus seat belt use in terms of behavioral intention. The theory involves factors such as perceived enforcement, past experience, and self-efficacy using structural equation modelling (SEM) and HBM. The results of the study show perceived severity, perceived benefits, and perceived barriers to be the most significant influence on bus seat belt use.

Iran has a mandatory seat belt usage law and enforcement program mandating that all passengers in the front and back seats of cars wear belts. Bus occupants are also covered by this law. Iran's traffic police enforcement fine bus drivers if a bus occupant (driver or passenger) does not wear a seat belt (Iran's traffic police enforcement, 2010). Despite this law, it should be noted that among the different types of vehicles, seat belts are most ignored by bus passengers and the rate of bus seat belt use is not specified in Iran. No study has been done to date in relation to bus seat belts in Iran. In other countries, there has been more focus on the use of bus seat belts on school buses (Mehta & Lou, 2013).

Although there have been several studies of bus and coach safety, attention to bus occupant safety is not reflected in the literature; consequently, the risk factors associated with passenger injury severity remain unknown. Despite the effectiveness of seat belt use in reducing the risk of death and serious injury from traffic accidents (Elvik et al., 2009; World Health Organization, 2015), a comprehensive study of low frequency seat belt use and the determinants of it in bus passengers has not yet been undertaken.

Increased bus seat belt use depends on recognizing factors related to this behavior. It is almost impossible to take appropriate measures to increase bus seat belt use without considering the determining factors.

Our research was directed at providing insight into bus seat belt usage determinants in Iran and hence introduces an additional perspective to help design better interventions to increase bus seat belt use. Recognizing useful factors related to bus seat belt use is useful for modeling interventional efforts aimed at preventing injuries and deaths.

Materials and Method

Study design

The qualitative research method was used since it is one of the most effective approaches for extracting the experiences and viewpoints of individuals and groups on a particular topic or phenomenon.

Participants

The aim of this study was to understand the viewpoints and opinions of all people related to the issue of bus seat belts. Four groups were identified and selected using the non-probabilistic and purposive sampling method: experts, traffic police, passengers, and bus drivers. Eligible passengers and drivers were selected from bus terminals in Tehran. The inclusion criterion for passengers was that they travelled by bus at least twice a month, and for drivers that they had at least two years of bus driving experience. In order to identify experts and traffic police, we communicated with the accident researchers by email and telephone and compiled a list on that basis. A postgraduate or PhD degree and 5 years of work experience with traffic accidents were considered the most important inclusion criteria for selecting this group. After reviewing

the inclusion criteria, 25 of 33 participants were invited to participate in the study, and 12 agreed to be interviewed. It should be noted that informed consent was obtained for participation in the study for all groups. The details on the participants in this study are presented in Table 2. Most of the participants were from the bus passenger group.

Table 2: Summary of participants' characteristics (N=60)

Characteristics	N	%
Experts (Health Education & Promotion, Epidemiology, Road Maintenance & Transportation)	12	20
Passengers	31	51
Drivers	9	15
Traffic Police	8	14
Female	14	24
Male	46	76
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Age	42	16

Data collection

This study comprised 60 participants. Data were gathered via semi-structured interviews. The interviewer was a researcher with experience in performing qualitative studies. Interviews were done in bus passenger terminals, universities, research centers, and traffic police offices in Tehran. A guide question was developed for semi-structured interviews and its content validity was checked by the research team. The interview session started with demographic questions (age, job tenure, education, experience with traffic issues, and travelling by bus). The interviews continued with more detailed questions about seat belt use. The guide questionnaire is shown in Table 3.

Table 3: Guide questions for interviews

Main question	Sub question
1) Do you use seat belts as a driver or front/rear passenger?	Reasons for using or not using a seat belt
2) How do you assess the safety of the buses?	Why?
3) In your opinion, is use of seat belts in buses necessary?	Why?
4) What happens in a bus accident if occupants are unbelted?	
5) Do you use a seatbelt on the buses?	What is the reason of it in your opinion?
6) What factors influence the use of seat belts in buses?	Why do some wear and some do not?
7) What are the barriers against using a bus seat belt in a bus?	
8) What are the benefits of bus seat belt usage?	
9) What are your suggestions for encouraging increased use of seatbelts in the bus trips?	

Each interview lasted from 20 to 40 minutes and at its conclusion 4 GB flash memory was provided to each participant as an incentive for their cooperation with our research. After transcribing the interviews, we sent the participants either an email or a letter to sign to confirm the accuracy of the interview text. The research team confirmed data saturation by

conducting 55 interviews. However, for further confirmation, 5 additional interviews were conducted, but no new data were found, so the process of interviewing was stopped.

Data analysis

A content-analysis method, employing the inductive approach and MAXQDA software, was used to analyze the interviews. After obtaining permission, the interviews were recorded, written, and reviewed. The contents of the interviews were coded by two independent researchers. Data analysis was performed simultaneously and continuously with data collection. In brief, the coding process involves extracting open code from participants' sentences (after reading the exact text of the interviews) and reviewing their code several times. Based on similarity and proportion, the codes that represented a single issue were placed in a category (subtheme). The main themes were determined by integration with a similar subtheme. This process was reviewed several times by the research team and then summarized.

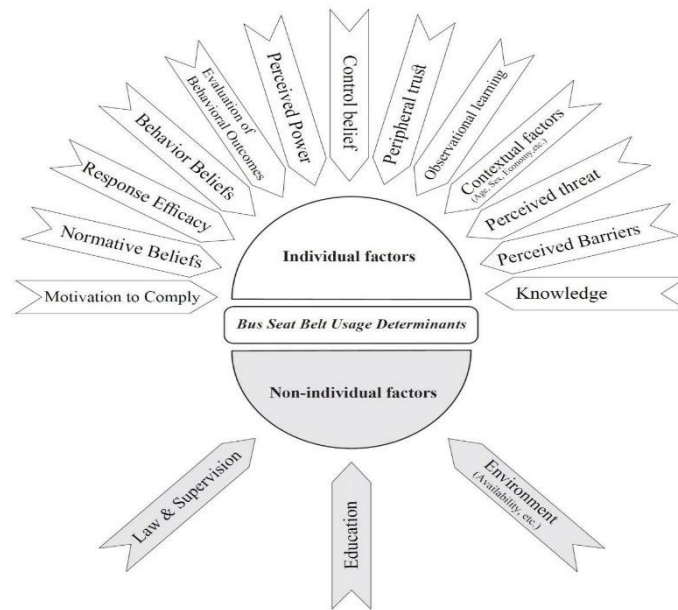
Trustworthiness

Guba and Lincoln's assessment method was used to ensure the validity and reliability of this study and four criteria were assessed: credibility, confirmability, transferability, and dependability (Golafshani, 2003). Long-term conflict engagement (immersion) and peer review were considered to achieve credibility. The description of the participants and the research environment were used for increased transmissibility. To approve conformability, we recorded all of the research activities over time. The data were reviewed by two independent individuals for confirmation of dependability.

Results

The findings indicate that 63% of the participants rarely, 21% never, 8% sometimes, and 3% always use seat belts on the bus. Furthermore, 5% of the participants (experts and traffic police) said they did not ride the bus. After the data analysis, 493 primary codes were extracted, with multiple revisions and merging of the codes based on similarity. Ultimately, 81 subthemes and 16 main themes were extracted. Similar themes were merged together and classified as individual and non-individual factors. Figure 1 shows the MAXQDA output of the main themes.

Figure 1: Determinants of bus seat belt usage



Individual factors

From the individual factors after the extraction codes were applied, the main themes that emerged included: knowledge, contextual factors, behavioral beliefs, evaluation of behavioral outcomes, normative beliefs, motivation to comply, control beliefs, perceived power, peripheral trust, observational learning, perceived barriers, perceived threats, and perceived response efficacy (Table 4).

Table 4: Classification of themes in the domain of individual and non-individual factors affecting the use of a seat belt

Category	Main themes	Sub-themes
Individual	Knowledge	Incorrect knowledge about seat belts, lack of knowledge
	Contextual factors	Age, sex, personality, skill, education, anthropometric characteristics, educational level, economic status, social status
	Behavioral beliefs	Believing that there is no need for a seatbelt on the bus, believing in the positive and negative outcome of seat belts, believing in the benefits of belts
	Evaluation of behavioral outcome	Value of health, outcome value of seat belt usage
	Normative beliefs	Opinion of Parents, friends, police and other passengers on the use of seat belts
	Motivation to comply	Considering the views of parents, friends, police, and other passengers for the use or non-use of a seat belt
	Control Beliefs	Difficulty and ease of wearing a seat belt in any situation
	Perceived Power	Emphasizes the ability of an individual to wear seat belts in any situation
	Peripheral trust	Trust in the bus, trust in the driver
	Observational learning	Seeing others using seat belts, witnessing bus accidents, and viewing television programs
Perceived barriers	Being annoyed by the belt, forgetting to wear it, limitation of motion caused by the seat belt	

Category	Main themes	Sub-themes
	Perceived Threats	Fear of a bus accident, lower perceived risk of a bus accident, perceptions of harm caused by not wearing a seat belt, perception of risk and fatal outcomes from not wearing seat belts, history of injuries and their severity in bus accidents
	Perceived response efficacy	Believing in the belt's performance in preventing damage, believing in the efficacy of wearing a seat belt on the bus
	Law and supervision	Emphasizes the role of the notification, reminders, and tangible/intangible control, the role of monitoring the existence of bus safety belts, the lack of serious requirements for safety belt laws, non-implementation of the law, the need to change laws using fines for those who fail to wear bus safety belts
Non-individual	Environment Education	Availability of bus seat belt, belt deterioration, type of bus Training, education about bus seat belts and bus accidents

Knowledge

Most participants stated that knowledge and awareness are important for bus seat belt usage. Some believed that a lack of awareness regarding bus seat belts was important.

"Peoples knowledge about belting in the bus is not good. No good information has been given to people, most people think that a seat belt is not necessary for the bus and more necessary for other vehicles."

(A health education expert)

"My way in such a way that the bus moves at low speed, and under such conditions, I feel safe and I do not use the seat belt."

(A 31-year-old female passenger)

"If I'm in a bus accident, I'm trapped in the bus during a fire or if it goes into the water."

(A 35-year-old male passenger)

Contextual factors

Some of the participants said that contextual factors such as personality, anthropometric characteristics, education, skills, training, and socio-economic and social situations played a role in their use of seat belts.

"Seat belt use can be related to aging. When an old rural man gets on a bus, if we tell him to wear his seat belt, he says haaa!!!"

(A bus driver with 7 years of work experience)

"In general, pregnant women cannot wear seat belts, especially on the bus."

(A traffic police officer)

"I'm fat; when I close my belt in the bus I cannot properly breathe."

(An overweight male passenger)

"Some individuals do not have the skills for using seat belts on the bus. For example, some of them are rural and shy or afraid to close the seat belt wrongly."

(A public health expert)

Behavioral beliefs

Many respondents thought that behavioral beliefs regarding the benefits and positive/negative outcomes of using seat belts can affect their use on buses. Some stated that wearing seat belts has a positive impact on health outcomes, resulting in fewer injuries and preventing deaths. Others said that wearing seat belts on the bus leads to a feeling of security, a proper style of sitting, and mental relaxation.

"I believe that the use of seat belts can prevent from throwing passengers out of the bus."
(A public health expert)

"Sometimes it's better that passengers do not wear seat belts because in a bus accident, the roof of the bus can be stuck to the seat and if the belt was closed, they would not escape."
(A bus driver)

"More than 80% of the time I wore the belt and this was only because of my belief in the consequences of not wearing it."
(A 33-year-old female passenger)

"If I don't use a seat belt in the bus, I feel my life is in danger."
(A 30-year-old male passenger)

Evaluation of behavioral outcomes

Several participants talked about the values that people consider regarding outcomes of the behavior.

"I think that those who belt in a bus are more likely to value their health and are futuristic."
(A bus driver)

"It is important for me to travel safely, so to prevent any unpredictable damage, I wear a belt."
(A 29-year-old female passenger)

"Some individuals do not realize the value of using seat belt, and therefore do not dedicate time to it."
(A health education expert)

Normative beliefs

Some of the respondents indicated that they thought about how other people tend to use seat belts on buses.

"I think wearing seat belt is not important for a bus driver."
(A 26-year-old male passenger)

Motivation to comply

Using seat belts on the bus can be related to other peoples' compliance rates. This means that how much the person wants to use a seat belt may depend to some degree on the opinion of others. Several participants stated that this is an important factor in bus seat belt usage.

"My dad wants me to belt in the bus, so I always close my belt in the bus."
(An 18-year-old male passenger)

"It is not important for bus drivers that the passengers are closing their belts, therefore, passengers do not take the belts seriously."
(A health education expert)

Control beliefs

Some of the participants believed that different conditions on buses may make it easy or difficult to wear a seat belt on the bus.

"Traveling by bus is very long. Sometimes you sit in the bus for 7 to 8 hours, sometimes 24 hours, and it's hard to wear seat belts in this situation."
(A public health expert)

Perceived power

Some of the participants in this study believed that the use of seat belts on the bus is related to the power of the individual to use a seat belt in any condition.

"Every time I get on the bus and immediately wear my seat belt, but I could not bear it and after a few minutes I opened it."
(28-year-old female passenger)

Peripheral trust

The amount of trust toward the bus or the driver's skills was another factor that was mentioned by the participants as an important element in the use of seat belts on the bus.

"Actually, many of them that who do not use seat belt in the bus think buses are big, so they feel more secure, some others also trust the driver and don't use."
(A traffic police officer)

"I do not trust the driver and try to keep to myself. In this mode, I feel so safe."
(A 29-year-old female passenger)

Observational learning

Some of the participants said that observing others wearing seat belts or witnessing bus accidents could affect the use of seat belts on the bus and could influence passengers to wear seat belts.

"I use a seat belt on the bus. The reason for this behavior goes back to the clip of a bus accident that I saw before and my studies in this area."
(A 36-year-old female passenger)

"When I see that other passengers and drivers not use a seat belt, I also do not belt in the bus."
(A 17-year-old female passenger)

Perceived barriers

Some of the respondents believed that forgetting, laziness, and feeling uncomfortable and trapped were some barriers to seat belt usage.

"Sometimes at the beginning of travel when I open the belt, I forget to close it again."
(A 20-year-old male passenger)

"I do not feel comfortable in Iranian buses. This uncomfortable condition causes me to not use a belt. Bus seats are not ergonomic. Bus air conditioning is not suitable. The same errors affect us psychologically and we were bored and do not wear a seat belt."
(Female passenger with a history of traveling by bus in other countries)

"I don't wear the belts in the bus because the seat belt wrinkles my clothes."
(A 31-year-old male passenger)

Perceived threats

This theme consists of perceived susceptibility and severity. Many of the participants said that the perceived threat of a bus accident is one of the determinants of using seat belts. The participants also believed that feeling vulnerable to injuries and death caused by a bus accident is an important factor in seat belt usage.

"I think if I do not belt on a bus, it's less dangerous compared to other vehicles."
(A 40-year-old male passenger)

"Honestly, I'm afraid of death and I wear a seat belt on all the cars."
(A 38-year-old female passenger)

"I'm wearing my belt because I know the consequences of a bus accident if one does not use the belt."
(A 45-year-old male passenger)

Perceived response efficacy

Belief in the efficacy or inefficacy of a behavior has a direct impact on the performance of that behavior. If people believe in the efficacy of wearing a seat belt on the bus, the likelihood of doing so will increase.

"Bus seat belts could not protect you. It does not protect from whiplash because the safety belt is just on the legs while the three-point belt protects most of the body."
(A health education expert)

"I wear a seat belt because it can prevent ejection."
(A 30-year-old male passenger)

Non-individual factors

In the area of non-individual factors after the extraction of the codes, the main themes that emerged included law and supervision, the environment, and education (Table 4).

Law and supervision

Some participants said that law and supervision are effective for seat belt usage on buses. The participants mentioned that supervision by drivers, bus hostesses, and traffic police is necessary to influence passengers to wear seat belts on bus.

“At the moment, controlling the wearing of seat belts is only done at the police station when drivers want to register their speed, but there is no supervision along the bus route. For example, if a police car moves next to the bus and sees passengers who are not wearing their seat belts, they will not take any legal action. I think we should be more serious about monitoring bus seat belts like other vehicles.”

(A traffic police officer)

“Surveillance mechanisms and controls are effective for using seat belts on the bus. In other vehicles, using/not using seat belts is visible for traffic police, but on the bus, this control is more difficult because it cannot be visible.”

(A traffic police officer)

“A reminder from the driver and bus host is important. Perhaps passengers forget to wear their seat belts. If it’s announced to wear seat belts on the route every one or two hours, this can make them sensitive.”

(An epidemiologist expert)

Environment

Environmental requirements should also be provided to change health behaviors. Some participants emphasized that the types of seat belts, access to proper belts, and bus types are important factors in the use of seat belts on buses.

“The belt type is not proper. I think it’s true that if the belt type is more proper passengers will use seat belts in the bus.”

(A public health expert)

“The seats of VIP buses are comfortable and passengers can wear seat belts but some of the buses have bad seats and wearing a seat belt is very difficult.”

(A bus driver)

Education

Some participants acknowledged that education plays a major role in seat belt usage among bus passengers.

“Actually, we don’t have any program for passenger education about using seat belts in the bus, not by police, radio, or television. Passengers do not know why they should close and how to close.”

(A health education expert)

“Bus driving classes emphasize that passengers must wear seat belts. But they do not teach us how to ask them to do this.”

(A bus driver)

Discussion

Most buses in use today are equipped with seat belts. The problem is that many bus drivers and passengers fail to use them. This qualitative study was administered through interviews with relevant stakeholders to identify factors that affect the use of seat belts on buses. Regarding the principles of qualitative research and the purpose of this study, the participants from the relevant subject groups were selected purposefully.

Health behavior is influenced by a variety of factors, both individual (biological, psychological, etc.) and non-individual (social, physical environment, policy, etc.) (Edgerton et al., 2002). In our findings, the perceived threat of bus accidents was an important theme. A low perceived threat could easily put individuals in danger (Rimal, Bose, Brown, Mkandawire & Folda, 2009). When people do not see themselves as exposed to the threat of a bus accident, protective behaviors such as seat belt usage on the bus will be minimized. Our findings support research indicating that a perceived threat was the most significant predicting factor for seat belt use. Previous research confirms that when a perceived threat is greater, passengers will adopt more positive attitudes toward seat belt use, whereas low perceived severity and sensitivity cause people to not use seat belts (Routley et al., 2010; Fernandes et al., 2010).

The present study showed that behavioral beliefs about the benefits of bus seat belt usage and its outcomes (positive and negative) were important factors that affected the use of bus seat belts. Perceived benefits included the advantages that an individual obtains for health behavior (Sheeran & Abraham, 1996) and these can play an important role in behavioral changes (Sullivan et al., 2008). Most of the participants stated that beliefs regarding the benefits of bus seat belt usage are the most important reasons for seat belt use. This is similar to the findings of previous studies that suggested that perceived benefits are strong predictors of seat belt usage (Şimşekoğlu & Lajunen, 2008).

The participants frequently referred to the positive outcomes of seat belt use (preventing ejection) and the negative outcomes of not using seat belts (such as injury or fines). Some of the participants also mentioned objective observations and referred to the negative outcomes of seat belt usage on the bus - for example, the feeling of being trapped. The explanation for this finding is that if a crash is severe enough to trap occupants in the vehicle, they will be trapped even if they are not wearing a belt. In severe accidents, safety belt usage can decrease injury and occupants can escape the vehicle. This supports previous studies that indicate that the perception of accident outcomes in humans results in fear and greater attention (Akbaş et al., 2010; Begg & Langley, 2000).

We recommend that informational campaigns emphasize the negative outcomes of not using seat belts and stress the benefits and positive outcomes of seat belt use on the bus.

Perceived barriers are the strongest predictor of seat belt use in self-reporting on urban roads (Ali, Haidar, Ali & Maryam, 2011). In this study, we observed that perceived barriers (such as restriction, annoyance, and the difficulty of use) are obstacles for the use of bus seat belts. This is consistent with the findings of another study indicating that restrictions on movement and difficulty using the seat belt were serious obstacles to the use of seat belts (Ali et al., 2011). Perceived barriers were the most important predictors of other health behaviors, such as wearing a helmet when riding a bicycle (Lajunen & Räsänen, 2004).

In the present study, perceived behavioral control (Control Beliefs and Perceived Power) and subjective norms (Normative beliefs and Motivation to comply) were determinants of the use of seat belts on buses. Some previous studies reported perceived behavioral control and

subjective norms as strong predictors of behavioral intentions (Lajunen & Räsänen, 2004; Madden, Ellen & Ajzen, 1992).

We also found that perceived response efficacy plays a role in bus seat belt use. Perceived response efficacy refers to a person's belief that the recommended behaviors will be effective in reducing or eliminating danger. Perceived response efficacy has been consistently found to be a significant positive influence on behavioral intentions (Johnston & Warkentin, 2010).

The present finding is consistent with recent research on this subject that showed there was a significant correlation between unsafe driving behaviors and perceived response efficacy (Morowatisharifabad, Momeni Sarvestani, Barkhordari Firoozabadi & Fallahzadeh, 2012). Therefore, it is expected that belief in the effectiveness of bus seat belt usage can increase usage among bus occupants. It seems that perceived response efficacy can be helpful for designing educational programs aimed at increasing bus seat belt usage.

Another finding of this study, reflecting the results of Lerner et al.'s (2001) research regarding the effects of demographic factors on the use of seat belts, indicated the effective role of contextual factors such as gender, age, and economic situation in the use of seat belts. Since the bus is a public vehicle and many different individuals use it, these features should be considered in the design of buses, seats, and seat belts.

The present study confirms the role of observational learning on the use of bus seat belts. This is consistent with other studies that found a link between observational learning and seat belt usage.

Observational learning can create completely new behaviors, increase or decrease the frequency of behaviors that have previously been learned, and reinforce banned behaviors (Cohen & Janicki-Deverts, 2012).

It follows that the observation of the use or lack of use of seat belts by the driver and bus passengers can affect the behavior of other passengers. Television and movies are also powerful sources of observational learning that can increase bus seat belt usage. Bandura's research showed that models such as family, community, and television can have positive or negative effects on behavior (Bandura, 2003).

It is interesting to note that the lack of awareness about the importance and efficiency of bus seat belts is a determining factor in seat belt use on the bus. This finding is consistent with Kuhn and Lam (2008), who referred to enabling factors, such as knowledge and skills, on seat belt use. Some passengers have incorrect information about bus seat belts; if they receive specific information on why they should wear seat belts on buses, then they might comply.

The effects of laws and supervision have been proven to promote health behaviors, especially seat belt use, and many countries employ these methods to increase the use of this safety device (World Health Organization, 2013).

The results of the present study confirm that law enforcement is more effective in increasing bus seat belt usage. In different countries, varying laws apply to the wearing of seat belts on buses (World Health Organization, 2009; Curtis, Rodi & Sepulveda, 2007). In many countries, passengers over the age of 14 years must use seat belts in buses and coaches (World health organization, 2015). In some countries, seat belts are not required for bus occupants, and in others front seats as defined by law include the first row of seats behind the driver. Evidence shows that all passengers on the bus are at risk and they should be strongly advised to wear seat belts. Passengers should be instructed to use seat belts through the use of an announcement or film. Drivers and traffic police should be more responsible for monitoring seat belt use by passengers because monitoring and supervision ensure the proper use of seat belts. In addition, each passenger should be legally responsible for using their seat belt.

Our findings showed that education is one of the most important factors in seat belt use by passengers. Both drivers and passengers need to be educated about the benefits of using bus seat belts. This could include specific education as part of driving lessons and licensing for bus drivers along with awareness campaigns for bus passengers. Previous research suggests that mixed policies, including education and enforcement interventions, can be supported by technological (engineering) solutions, such as the use of seat belt reminder alarms in vehicles (Uthman, Sinclair, Willems & Young, 2014).

It should be noted that designing training for a heterogeneous audience with a variety of demographic and behavioral characteristics is simply not possible and the design of appropriate and effective educational programs requires more research.

The results of this study showed that trust in the driver and the bus were determining factors in the use of seat belts. This finding is consistent with other research that found that lack of trust in others is a determining factor in seat belt usage (Şimşekoğlu & Lajunen, 2008). In addition, other evidence shows that locus of control and lack of confidence in the driver are factors that create fear in passengers (Chliaoutakis, Gnardellis, Drakou, Darviri & Sboukis, 2000; Nambulee et al., 2018).

Strengths, Limitations and Future Research

This study is a first attempt to understand bus seat belt usage determinants. The coordination of two researchers in the data analysis and coding process, which involved a variety of stakeholders, was a strength of our study. One important limitation of the study is that the results were based on the opinions of the participants, although they did not have a great impact on the reliability of the results. Also, this study used only an Iranian sample. It is possible that factors discouraging seat belt on buses may vary in other countries. So a cross-cultural study in several countries is needed to reveal comprehensive factors related to bus seat belt usage.

Conclusion

Injuries and deaths from bus accidents in Iran are very serious and solutions should be sought. Using safety equipment, such as a seat belt, on a bus is one way to reduce mortality from bus accidents.

In this study, two categories of individual and non-individual factors were identified as determinants of bus seat belt usage. Designing interventions for both categories of factors is strongly recommended. For example, educational programs can emphasize the reduction of perceived barriers and the negative outcomes/threats related to not wearing seat belts.

The design of intervention programs should also consider the role of related organizations, such as traffic police and road maintenance and transportation organizations, in facilitating and eliminating barriers to bus seat belt usage.

Compliance with ethical standards

All procedures, including the informed consent process, were conducted in accordance with the ethical standards of the responsible committee on human experimentation (institutional and national) and with the Helsinki Declaration of 1975, as revised in 2000.

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