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Are Demographic Characteristics Able to Predict Risky Behaviors of Pedestrians?

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ABSTRACT

Background: Despite the considerable health benefits of walking on human health, pedestrian traffic accidents seriously threaten people's safety. Specifically, the risky behaviors of pedestrians may lead to dangerous situations while crossing the road. Few studies have examined the relationship between high-risk pedestrian behaviors and some of their characteristics. The present study aimed to investigate the risky behaviors of pedestrians and their relationship to some demographic variables while crossing the street.

Methods: This descriptive-analytical study was conducted among 700 pedestrians over 18 years old. Data were collected using the Pedestrian Violations Questionnaire (PVQ). Convenience sampling was done in areas with different socioeconomic levels. The data were analyzed by the SPSS version 16 using an independent *t-test*, one-way ANOVA, chi-square, and Fisher exact tests at a significance level of 0.05.

Results: The results indicated a significant relationship between risky pedestrian behaviors and demographic variables, including age, marital status, and education. However, there was no statistically significant difference between the risky behaviors of females and males and their involvement in accidents.

Conclusion: Pedestrian risky behaviors seem to be strongly correlated with age. Education can also be a predictor of risky behaviors.

1. Introduction

In recent years, walking has become increasingly popular for improving public health [1]. Even though walking provides many health benefits, crossing the street and walking on the streets has become an obvious hazard [2]. Since pedestrians lack safety equipment, they are more prone to injuries and accidents caused by traffic accidents than car passengers. Pedestrians are considered the most vulnerable users of the transportation system, and their injuries in accidents are significantly higher than those of other users [3, 4]. Moreover, there is strong evidence that pedestrians are more likely to be involved in traffic accidents when crossing the street due to poor decision-making or risky behaviors than other users [5]. In traffic accidents worldwide, thousands of pedestrians are killed and 10000 are injured in traffic annually [6]. The number of pedestrians killed in traffic accidents accounts for 22% of all fatalities worldwide [7]. The rapid growth of the population in developing countries also contributes to pedestrian accidents. According to recent studies, pedestrian accidents increase by 1.4% per 1000 people [4]. It has been demonstrated that road users play a major role in accidents than other factors, including vehicles and the environment [8]. Pedestrian accidents mostly occur while crossing the street, and approximately 30% result from violating traffic

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and driving laws [9]. The majority of pedestrians (46%) violate traffic laws and use unsafe crossings or show risky behavior when crossing the street, to save time [10-12]. Until the third millennium, most pedestrian safety studies focused on environmental factors (e.g., road width, traffic lights) or driver-related factors, and pedestrian contribution to traffic accidents was to a great extent overlooked. Over the past two decades, researchers have investigated the correlation between risky pedestrian behaviors and personality/ demographic variables [13]. In most of the studies, age and gender were examined concerning pedestrian behavior; however, the results differed. Antić et al. (2016) and Liu et al. (2022) found that males are more likely to violate the rules while crossing the street in China and Serbia [14, 15]. In contrast, Zareharofteh et al. (2021) found no significant difference between the traffic behaviors of male and female pedestrians [16]. Regarding age, researchers have shown pedestrians use safe crossings and behave more cautiously as they age [17, 18]. Nevertheless, Poó et al. (2018) did not find this difference in Argentinian pedestrians [19]. In light of these contradictions, further research is needed. Therefore, the present study investigated the relationship between pedestrian traffic behaviors and demographic variables.

2. Materials and Methods

In this cross-sectional study, the ethical codes, including informed consent and the confidentiality of the participants' information, were observed.

2.1 Participants

In the present study, 700 pedestrians over 18 participated. They were chosen through convenience sampling from recreational, commercial, medical, and educational places. The participants came from areas with different socioeconomic backgrounds.

2.2 Questionnaire

The Pedestrian Violations Questionnaire (PVQ), which was validated in a master thesis, was used to examine the relationship between the traffic behaviors of pedestrians and demographic characteristics. This questionnaire consisted of two parts. The first part includes demographic characteristics (gender, age, marital status, education, and accident involvement as a pedestrian). The second part has 19 items that evaluate the traffic behavior of pedestrians in three dimensions (interaction with technology, breaking the law, and unsafe behaviors). PVQ is rated on a 5-point Likert Scale from 1 (never) to 5 (always) [20]. The first factor, interaction with technology, included eight items that evaluate the behavior of pedestrians in using cell phones. The second factor, breaking the law, has five items related to behaviors that violate pedestrian traffic laws and regulations. The third 6-item factor, unsafe behaviors, refers to behaviors that are not mentioned in traffic laws, but performing such behaviors increases the likelihood of traffic accidents. We interviewed pedestrians of Karaj, Iran and collected their opinions via an online platform (porsline.ir).

2.3 Data Analysis

First, all pedestrian behaviors were divided into two groups: 1-relatively low-risk behaviors (rarely and never responses) and 2-risky behaviors (sometimes, often, and always responses). Then, the normality of the data was confirmed by the coefficient of skewness and kurtosis [21]. Finally, the mean, standard deviation (SD), and relative frequency were calculated for each variable. Independent *t-test* and one-way ANOVA were used to compare the mean score of each questionnaire factor (interaction with technology, breaking the law, and unsafe behaviors) and demographic characteristics. Further, the Chi-square and Fisher exact tests determined the frequency of each traffic behavior of pedestrians with demographic characteristics. Statistical SPSS software version 16 analyzed the data at a significance level of 0.05.

3. Results and Discussion

The target population in this study consisted of 700 participants of males (51%) and females (49%). Their mean age ranged from 38.76 ± 13.82. Most of them were married (66%), and 50% of the participants had a university education. The majority (85%) had no history of accident involvement (Table 1).

Table 1: Demographic characteristics of the participants

Characteristics		N= 700
Age, year	Mean (±SD)	38.76 (±13.82)
Gender, frequency (%)	female	342 (48)
	male	358 (51)
Education, frequency (%)	middle school and lower	81 (11)
	high school and diploma	264 (37)
	university- undergraduate	253 (36)
	university - postgraduate	102 (14)
Marital status, frequency (percent)	single	238 (34)
	married	462 (66)
Accident involvement, frequency (percent)	with	110 (15)
	without	590 (85)

The relationship between pedestrian traffic behavior scores and demographic variables was investigated using an independent *t-test* and one-way ANOVA. As indicated by Table 2, there is no statistically significant difference (P = 0.448) between males and females in terms of traffic behavior; however, there was a significant difference in age, marital status, and education (p = 0.0001). Table 3 provides descriptive statistics based on pedestrian risky traffic behavior with demographic variables.

3.1 Interaction with technology

The results showed that not only the mean score of participants interacting with technology is different in various age groups (p = 0.0001) (Table 2), but also the risky behaviors related to interaction with technology are significant among age groups (p = 0.0001) and has the highest frequency in ages between 18-29 years. No significant statistical difference was found between males and females in this component, except for item 4 "*I listen to music or other digital sounds with headphones/hands-free while crossing the street.*" This behavior was observed significantly higher in female than male pedestrians (p = 0.01). The most common risky behavior was related to item 5 "*When crossing the street, I use the cell phone to talk with or without headphones/hands-free.*" Indeed, the lowest frequency was observed in item 8 "*While crossing the street, I take a photo or video with your cell phone when something catches my attention.*", which was reported in males (9.8%), married participants (7.8%), and middle education and less (7.4%). The most significant difference in risky behaviors concerning technology relates to marital status. In other words, single participants displayed more risky behaviors than married ones (P = 0.001). Except for item 7 "*While crossing the street, I enter a new destination into a navigation system.*" (P = 0.54). Regarding education, the relationship between education and risky behaviors was different based on the items of interaction with technology. There was a significant correlation between education and items 3, 4, and 5: "*I use a cell device to access the internet while crossing the street*" (p = 0.002)," *I listen to music or other digital sound with headphones/hands-free while crossing the street*" (p = 0.001), and "*When crossing the street, I use the cell phone to talk with or without headphones/hands-free*" (p = 0.01). However, the relationship between education and other items did not turn out to be significant (p > 0.05). The middle school and lower groups showed the lowest frequency (7.4% - 23.5%). In addition, no statistically significant difference was observed between the items of interaction with technology and participants with a history of accident involvement. It was also found that 202 out of 700 participants (less than 30%) did not display risky behaviors related to technology interaction; the rest reported at least one risky traffic behavior. Concerning the second component of the questionnaire, the results indicated risky behaviors were very frequent in all items. Although some differences were observed between some groups of this component; however, there is no significant difference between the two genders (Table 2).

3.2 Breaking law

As shown in Table 3, gender does not have a statistically significant effect on the risky behaviors of the participants in any of the items of the breaking law (p > 0.05). The lowest and highest frequency was related to item 1 "*I start to cross on a pedestrian crossing and I end up crossing it diagonally.*" and item 5 "*I do not use pedestrian bridges or underpasses*" in males (66.8%) and females (90.6%). Although the relationship between this component and the mean score of marital status was significant (p = 0.0001), only two out of five items differed between single and married pedestrians, including "*I cross the street even though the pedestrian light is red*" (p = 0.003) and "*I do not cross outside the pedestrian crossing*" (p = 0.013). The lowest and highest frequency was related to "*I start to cross on a pedestrian crossing and I end up crossing it diagonally.*" and "*I do not use pedestrian bridges or underpasses*" in married pedestrians (66.5%) and singles (91.2%). Concerning education, there was a significant relationship between two items 1 and 2: "*I start to cross on a pedestrian crossing and I end up crossing it diagonally.*" (p = 0.04) and "*I cross the street even though the pedestrian light is red*" (p = 0.04). The lowest and highest frequency was related to "*I start to cross on a pedestrian crossing and I end up crossing it diagonally.*" and "*I do not use pedestrian bridges or underpasses*". In post-graduated pedestrians (60.8%) and middle school and lower (92.6%), respectively. Risky behaviors in this component were observed for all age groups and the lowest was 62.9%. However, significant differences were notable for all items among different age groups (p ≤ 0.015). Further, no statistically significant difference was observed between the items of this component and participants with a history of accident involvement. The most common risky behavior was related to item 5 "*I do not use pedestrian bridges or underpasses.*", males (88.3%), singles (91.2%), and undergraduate participants (85.3%). The least risky behavior in this component was item 1 "*I start to cross on a pedestrian crossing and I end up crossing it diagonally.*" This behavior was found in females (71.3%) and married participants (66.5%). One of the remarkable results in this field was that out of 700 participants, there were only 29 people who did not report risky behaviors related to breaking the law, and the rest reported at least one risky behavior.

3.3 unsafe behaviors

Concerning the last component of the questionnaire, "unsafe behaviors," risky behaviors were high in the age groups of 18-29 years. However, no significant difference was reported for items 4, 5, and 6: "*When I wait for the traffic light to turn green, I stand on the side of the street, not on the sidewalk.*" (p = 0.064), "*When there is a line of stopped cars, before reaching the crosswalk, I cross the street between stopped cars.*" (p = 0.152), "*While waiting for an app/taxi, I stand on the side of the street instead of the sidewalk.*" (p = 0.072). According to Table 3, no significant difference was identified between gender and items of unsafe behaviors (p > 0.05). The female participants showed the lowest frequency (27.8%) for item 2 "*I cross even if cars are coming.*", and the male participants had the highest frequency (94.7%) for item 5 "*When there is a line of stopped cars, before reaching the crosswalk, I cross the street between stopped cars*".

Table 2: The relationship between the pedestrian traffic behaviors (total score and sub-scales) and demographic variables

Demographic characteristics	Total score Mean (standard deviation)	Interaction with technology Mean (standard deviation)	Breaking law Mean (standard deviation)	Unsafe behaviors Mean (standard deviation)
		Age		
18 to29 years	55.54 (±8.09)	19.49 (±3.73)	16.67 (±2.91)	19.29 (±3.59)
30 to 45 years	50.00 (±7.51)	16.95 (±3.62)	15.36 (±3.15)	17.69 (±3.41)
more than 45 years	45.15 (±6.93)	12.77 (±3.73)	15.40 (±3.33)	16.98 (±3.59)
F *(P)*	99.947 (0.0001)*	177.260 (0.0001)*	14.366 (0.0001)*	24.08 (0.0001)*
		Gender		
female	50.52 (±8.32)	16.62 (± 4.32)	16.02 (± 3.06)	17.87 (± 3.43)
man	50.03 (± 8.73)	16.38 (±4.71)	15.59 (± 3.31)	18.06 (±3.82)
T *(p)*	0.759 (0.448)	0.718 (0.473)	1.784 (0.075)	-0.618 (0.496)
		Marital status		
single	55.22 (± 8.24)	19.33 (± 3.77)	16.42 (± 3.05)	19.46 (± 3.61)
married	47.73 (±7.51)	15.04 (± 4.18)	15.48 (± 3.22)	17.12 (± 3.40)
T *(P)*	12.088 (0.0001)*	13.74 (0.0001)*	3.721 (0.0001)*	8.127 (0.0001)*
		Education		
middle school and less	48.19 (±8.14)	13.69 (±4.79)	16.13 (±3.61)	18.37 (±3.35)
high school or diploma	51.51 (±9.01)	16.75 (±4.7)	16.35 (±3.23)	18.40 (±3.58)
master's degree or bachelor's degree	50.56 (±8.31)	17.09 (±4.24)	15.46 (±2.97)	18.40 (±3.58)
above bachelor's degree	48.01 (±7.38)	16.61 (±3.40)	14.96 (±3.05)	16.44 (±3.57)
F *(P)*	6.058 (0.0001)*	12.76 (0.0001)*	6.332 (0.0001)*	7.845 (0.0001)*
		Accident involvement		
with	50.040 (±8.79)	16.26 (±4.80)	15.77 (±3.31)	18.36 (±3.85)
without	50.25 (±8.49)	16.54 (±4.47)	15.80 (±3.18)	17.90 (±3.59)
T *(P)*	0.162 (0.871)	-0.603 (-0.546)	-0.107 (-0.914)	1.227 (0.220)

* T: independent sample *t-test*, F: one-way analysis of variance (ANOVA), p<0.05

Furthermore, the findings indicated a significant difference between items of unsafe behaviors and marital status. In other words, married participants had more risky behaviors than single ones (p = 0.001) except for item 5 "*When there is a line of stopped cars, before reaching the crosswalk, I cross the street between stopped cars.*" (p = 0.97). Table 3 also shows a strong relationship between the educational level of pedestrians and items of unsafe behaviors. It should be noted that no significant difference was detected between academic level and items 2, 4 "*I cross even if cars are coming.*" (p = 0.59) and "*when I wait for the traffic light to turn green, I stand on the side of the street, not on the sidewalk.*" (p = 0.22). Items 3 (14.7%) and 5 (97.3%) showed the lowest and highest frequencies, respectively. In addition, no statistically significant difference was observed between the items of this component and participants with a history of accident involvement. The most common risky behavior in this component is related to item 5 in male participants (94.7%) and those with high school and lower education (97.3%). In addition, the highest frequency was reported for item 4 among single participants (95.8%). Item 2 had the lowest frequency in female participants (30.4%), married participants (22.1%), and those with undergraduate degrees (27.8%). Additionally, only five out of 700 participants did not report any risky behaviors related to unsafe behaviors. More interestingly, only two participants did not report any of the risky behaviors. This cross-sectional study investigated the relationship between pedestrian traffic behavior and demographic variables such as gender, age, education, and marital status in Iran. In order to collect the required data, we used the PVQ, which consists of three components: interaction with technology, breaking the law, and unsafe behaviors [20]. Since other studies have not necessarily investigated such dimensions, the results of the present study cannot be completely compared with related studies. However, we tried to comment more decisively about the possibility of predicting the behavior of pedestrians based on demographic variables.

3.4 Age

Age is the most important demographic variable that has been considered in the literature on this issue. As stated earlier, interaction with technology has a statistical relationship with age; therefore, concerning interaction with technology, young adults in the age group of 18-29 were the population of the most frequent users of cell phones (Table

2). In addition, risky behaviors in all items of this component were significantly higher among pedestrians under 30 (Table 3). Several studies have reported relatively similar results. The difference in cell phone use in a particular age group (18-30 years) is reported in some research [22]. Some other studies point to the same difference by expressing the age group of young people [13]. Studies have also investigated the number of accidents leading to injury and death of pedestrians and found that using headphones was more common among those under 30 years [23]. Lennon et al. (2017) conducted a study on the effect of age on using smartphones while crossing the street. Their findings revealed that young adults are more familiar with cell phones and have a positive attitude and a stronger intention to use them when crossing the street [22]. The current study found a statistically significant relationship between the age of pedestrians and law violation. It means that young people violate the law more than others (Table 2). In all items of this component, risky behaviors were significantly high in adults younger than 30 years old than others (Table 3). Several studies have been carried out on violating traffic rules and stopping at red lights. The findings showed that pedestrians behave cautiously as they age when crossing the street [24-28]. Therefore, it can be concluded that age is a strong predictor for determining the traffic behaviors of pedestrians. It should be noted that the World Health Organization (WHO) proclaimed that road accident mortality occurs in vulnerable groups at a young age [29].

3.5 Gender

In the present study, the relationship between gender and PVQ components was investigated. Based on the findings, no significant relationship was observed between gender and risky traffic behaviors (Table 2). The only exception, in this case, is the use of headphones and hands-free when crossing the street, which was significantly more in women than in men (Table 3). However, in studies on cell phones with/without headphones or hands-free, men have always allocated a larger share [23]. Research conducted in Iran [25, 30], China [31], and the United States [32] showed that the traffic behavior of female pedestrians is better than that of male pedestrians. In contrast, Dommes et al.ʼs study in France revealed that gender does not significantly affect violations of red light regulations and other safety-related cases [28]. On the other hand, a similar study in China showed that women are more likely to violate driving laws than men [27]. Considering that different studies have obtained conflicting results, other underlying factors influence gender as a predictor of pedestrian behavior, which may be currently unknown.

3.6 Marital status

The third variable was concerned with the relationship between marital status and risky traffic behaviors. Marital status was found to have no relationship with the risky behaviors of pedestrians (Table 2). This finding agrees with a parallel study by Tavakolizadeh et al. (2011), who found no significant correlation between marital status and cell phone use [33]. Yet, this is despite some studies stating that married people commit violations. Moreover, they show aggressive and distracting behaviors less than others [5, 30]. Therefore, the marital status of pedestriansʼ behavior still needs further investigation. Nevertheless, the alignment of age and marriage should not be overlooked. In fact, the effect of marriage on pedestrian behavior may be influenced by age-related changes.

3.7 Education

The results also indicated a significant positive relationship between education and behaviors of pedestrians. Based on the findings of the present study, education can be a predictor of pedestriansʼ behaviors. The frequency of unsafe behaviors in participants with higher education levels is lower than in others. The results obtained in the present study are consistent with the results of most similar studies [5, 34, 35]. Based on the findings, education was the best and more possible predictor of pedestriansʼ traffic behaviors.

3.8 Accident Involvement

The history of pedestrian involvement in accidents is another demographic variable that was examined in this study. The results of the present study showed no significant relationship between the history of accidents as a pedestrian and any of the questionnaire components (Table 2). These findings contrast with previous results reported in the literature [30]. However, various studies were conducted to investigate the relationship between the history of accidents and the traffic behaviors of other vulnerable users (bicyclists, motorcyclists, etc.). The results showed that a history of involvement in accidents is associated with risky behaviors and violations of driving rules [36-38]. Therefore, we cannot have a firm opinion about predicting the history of pedestrian involvement in accidents about the behavior of pedestrians. The overall results of this study were that among 700 participants, 202 cases (less than 30%) showed no risky behaviors related to interaction with technology, 29 cases related to breaking the law, and 5 cases concerning unsafe behaviors (Table 2). While studies conducted in Italy indicated the effect of cell phone use on pedestrian crossing behavior (30%) [39]. The behavior of violating the law of passing against the traffic light was reported by 32%, and crossing outside the pedestrian line by 15%, and at least half of the pedestrians (52%) showed at least one unsafe crossing behavior on the road in the United States [40]. These comparisons show that modifying the behavior of pedestrians in Iran is a serious need.

Table 3: Relationship between risky traffic behavior of pedestrians with demographic characteristics

Factor	Items	Age (percent)			*p - value*	Gender (percent)		*p - value*	Marital status (percent)		*p - value*	Education (percent)				*p - value*	Accident involvement (percent)		*p - value*
		18 - 29	30 -45	Above 45 Years		female	Male		single	married		middle school and lower	high school and diploma	university undergraduate	university postgraduate		with	without	
	If I get a cell phone message/text while crossing the street, I read it.	49.5	34.2	7.3	0.0001	29.5	32.4	0.41	48.7	21.9	0.001	23.5	33	34.3	23.5	0.08	35.5	30.2	0.27
	While crossing the street, I text a cell phone message	29.9	12.8	2.9	0.0001	14	16.2	0.42	28.2	8.4	0.001	13.6	16.3	16.6	9.8	0.37	17.3	14.7	0.49
	While crossing the street, I use a cell device to access the internet	43.9	19.6	6.3	0.0001	24.3	22.1	0.49	45	11.9	0.001	12.3	27.7	25.7	13.7	0.002	18.2	24.1	0.17
	I listen to music or other digital sound with headphones/hands-free while crossing the street.	61.2	38.8	9.8	0.0001	48.5	33	0.01	59.2	25.8	0.001	16	43.2	39.9	31.4	0.001	31.8	38.1	0.2
Interaction with technology	When crossing the street, I use the cell phone to talk with or without headphones/hands-free.	72	53.7	23.9	0.0001	47.1	53.9	0.07	72.3	39.4	0.001	33.3	53.3	54.2	51	0.01	58.2	49.2	0.08
	While crossing the street, I access social media (e.g., WhatsApp, Instagram)	36.9	22.4	6.3	0.0001	20.8	23.5	0.38	37	14.5	0.001	14.8	22.7	24.5	20.6	0.31	27.3	21.1	0.15
	While crossing the street, I enter a new destination into a navigation system.	16.8	19.2	5.4	0.0001	14	14.8	0.77	15.5	13.9	0.54	9.9	18.6	13	10.8	0.09	14.5	14.4	0.97
	While crossing the street, I take a photo or video with your cell phone when something catches my attention.	19.6	11.7	3.4	0.0001	13.7	9.8	0.10	19.3	7.8	0.001	7.4	12.1	11.9	13.7	0.59	12.7	11.5	0.71
Breaking law	I start to cross on a pedestrian crossing and I end up crossing it diagonally.	77.1	67.3	62.9	0.005	71.3	66.8	0.19	73.9	66.5	0.42	69.1	74.6	66.4	60.8	0.04	62.7	70.2	0.12
	I cross the street even though the pedestrian light is red.	87.4	80.1	75.1	0.005	83.3	78.5	0.104	87	77.7	0.003	71.6	84.8	81	77.5	0.04	81.8	80.7	0.78
	When crossing the street, I go through places where pedestrians are not allowed to pass (roundabouts, squares, diameter of the intersections, etc.).	90.2	80.4	82.4	0.01	86.5	81.6	0.07	87.4	82.3	0.07	91.4	85.6	82.2	78.4	0.08	81.8	80.7	0.78
	I do not cross outside the pedestrian crossing.	88.3	77.2	78.5	0.004	82.7	79.3	0.24	86.1	78.4	0.013	75.3	86.4	79.1	76.5	0.35	81.8	84.4	0.49
	I do not use pedestrian bridges or underpasses	93.9	89	85.4	0.015	90.6	88.3	0.30	91.2	88.5	0.28	92.6	91.7	87.7	85.3	0.180	84.5	80.3	0.30
	When crossing the street, regardless of the traffic lights and the movement of cars, I will cross if other pedestrians are crossing the street.	73.8	53.7	43.4	0.0001	57	56.7	0.93	73.5	48.3	0.001	63	61	60.1	33.3	0.001	91.8	89	0.37
	I cross even if cars are coming.	45.8	24.9	19.5	0.005	27.8	31.6	0.27	44.5	22.1	0.001	30.9	33	30.4	18.6	0.59	59.1	56.4	0.60
	I cross even though obstacles obstruct the visibility of the traffic flow.	44.4	31	29.3	0.001	33.9	35.2	0.72	44.5	29.4	0.001	37	43.2	32.8	14.7	0.001	36.4	29.7	0.94
Unsafe behaviors	When I wait for the traffic light to turn green, I stand on the side of the street, not on the sidewalk.	94.9	92.5	88.8	0.064	93	91.3	0.42	95.8	90.3	0.01	96.3	91.7	92.2	88.2	0.22	90.9	92.4	0.6
	When there is a line of stopped cars, before reaching the crosswalk, I cross the street between stopped cars.	92.1	95.7	95.6	0.152	94.4	94.7	0.88	94.5	94.6	0.97	95.1	97.3	93.3	90.2	†0.03	95.5	94.4	0.65
	While waiting for an app/taxi to arrive, I stand on the side of the street instead of the sidewalk.	92.1	90	85.4	0.072	90.4	88.3	0.37	94.5	86.6	0.001	92.6	88.6	87.7	92.2	†0.029	88.2	89.5	0.68

* Fisher exact test

4. Conclusion

The main purpose of this study was to highlight the relationship between demographic variables (age, gender, marital status, education, accident involvement) and components of PVQ (interaction with technology, breaking the law, unsafe behaviors). The results indicated that marital status, education, and age strongly predict pedestrians' behaviors. Therefore, appropriate training in schools and through public media and social networks can significantly reduce pedestrian deaths.

Authors' Contributions

Anahita Abbaspour: Pedestrian interview; Data gathering; The manuscript drafting. Khadija Hajimiri: Methodology; Data curation; Statistical analysis; writing-review and editing. Shirazeh Arghami: Conceptualization; Methodology; Supervision; Resources; Funding acquisition; Finalization of the manuscript.

Conflicts of Interest

The authors declare no conflict of interest.

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