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HEALTH LITERACY AND BASIC FIRST AID KNOWLEDGE AMONG DRIVER'S LICENSE APPLICANTS: A CROSS-SECTIONAL STUDY IN TÜRKİYE

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ABSTRACT

Aim: Traffic accidents are a major public health problem worldwide, and first aid competence of drivers plays a critical role in reducing morbidity and mortality. Health literacy (HL) has been shown to influence health outcomes, but its relationship with first aid knowledge remains unclear. This study aimed to evaluate the association between health literacy and first aid knowledge among driver's license applicants in Türkiye.

Methods: A cross-sectional analytical study was conducted between June and November 2023 at the Family Medicine Outpatient Clinic of Başakşehir Çam and Sakura City Hospital, Istanbul. A total of 138 applicants aged 18–60 years who sought a medical report for a driver's license were included. Data were collected using a sociodemographic questionnaire, a 20-item First Aid Knowledge Questionnaire, and the 12-item Health Literacy Scale–Short Form (HLS-SF). Descriptive statistics, Pearson correlation, independent t-tests, and one-way ANOVA with post-hoc tests were applied ($p<0.05$ considered significant).

Results: The mean age of participants was 30.4±10.6 years; 58.7% were female. The mean first aid knowledge score was 11.1±3.5, indicating low-to-moderate knowledge, while the mean HLS-SF index score was 32.1±8.9, corresponding to a moderate level of health literacy. No significant correlation was found between health literacy and first aid knowledge ($r=0.150$, $p=0.080$). However, higher educational attainment ($p=0.002$), previous first aid experience ($p<0.05$), and greater self-confidence ($p<0.05$) were significantly associated with higher knowledge scores. Notably, self-confidence was also significantly associated with higher HL scores.

Conclusions: Driver's license applicants demonstrated moderate health literacy but relatively low first aid knowledge. Although no direct correlation was observed between the two constructs, education, prior first aid experience, and self-confidence were key determinants of better outcomes. Integrating self-efficacy-focused, simulation-based training into driver education programs could improve both first aid competence and health literacy, contributing to enhanced traffic safety and public health.

Keywords: Health literacy, First aid, Driver's license applicants, Traffic accidents, Self-confidence

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INTRODUCTION

Traffic accidents remain a critical global public health challenge, with millions of injuries and hundreds of thousands of deaths occurring annually. According to the World Health Organization (WHO), road traffic accidents are the leading cause of death among individuals aged 5–29 years, highlighting the urgent need for effective preventive strategies and community-based interventions [1]. In Türkiye, official statistics reported more than 1.2 million road traffic accidents in 2022, with nearly 200,000 resulting in injury or death [2]. Importantly, more than half of all traffic accident-related deaths occur before the patient reaches a hospital, underscoring the essential role of immediate and effective first aid at the scene [3].

First aid refers to timely, simple, and often life-saving interventions provided by bystanders until professional medical care becomes available. Studies have shown that early initiation of cardiopulmonary resuscitation (CPR), bleeding control, and airway management can substantially reduce morbidity and mortality [4,5]. Conversely, inappropriate or delayed first aid interventions may worsen outcomes. Therefore, the dissemination of accurate and practical first aid knowledge among the general population is a public health priority. Drivers, as frequent witnesses or victims of road traffic accidents, constitute a particularly important target group for first aid education [6].

Health literacy (HL) is another crucial determinant of health outcomes. Defined by the WHO as the ability to obtain, process, understand, and apply health information to make informed health decisions, health literacy extends beyond basic reading skills to encompass decision-making, navigation of health systems, and preventive health behaviors [7]. Low health literacy has been associated with reduced adherence to medical instructions, poor chronic disease management, increased hospitalization rates, and higher health care costs [8]. Improving health literacy is increasingly recognized as a pathway to better population health and equity [9].

Given the overlapping importance of first aid competence and health literacy, it is reasonable to hypothesize that individuals with higher HL levels may demonstrate superior first aid knowledge and confidence. However, empirical evidence exploring this relationship remains limited, particularly in the context of driver's license applicants, who are required by law to undergo first aid training as part of their preparation. In Türkiye, mandatory first aid courses are integrated into driving school curricula, but concerns persist about the adequacy, standardization, and long-term retention of the knowledge provided [10].

This study therefore aimed to evaluate the relationship between health literacy and first aid knowledge levels among driver's license applicants attending a family medicine outpatient clinic in Istanbul, Türkiye. By identifying whether higher health literacy is associated with improved first aid knowledge, this research contributes to the growing body of literature on the intersection of health literacy and practical emergency preparedness, with implications for traffic safety and public health policy.

METHODS

Study Design and Setting

This was a cross-sectional and analytical study conducted between June 1 and November 30, 2023, at the Family Medicine Outpatient Clinic of Başakşehir Çam and Sakura City Hospital, Istanbul, Türkiye. The study was designed to assess the relationship between health literacy and first aid knowledge among individuals applying for a medical report required for obtaining a driver's license.

Participants

The study population consisted of adults aged 18–60 years who presented to the outpatient clinic requesting a driver's license health report during the study period. A total of 138 participants who voluntarily agreed to take part and completed the questionnaires were included.

Inclusion criteria were: Age ≥18 years, application for a driver's license health report, consent to participate in the study.

Exclusion criteria were: Refusal to provide informed consent, incomplete questionnaire responses, history of cognitive impairment or communication difficulty that might affect questionnaire completion.

Data Collection Instruments

Data were collected through a structured survey consisting of three parts:

Sociodemographic Information Form (15 items): Included age, sex, marital status, education level, and prior first aid training experience.

First Aid Knowledge Questionnaire (20 items): Assessed participants' knowledge on basic first aid practices, including CPR, bleeding, airway obstruction, fractures, and burns. This questionnaire was adapted from previously validated tools (11,12) and had acceptable internal consistency (Cronbach's $\alpha = 0.687$).

Health Literacy Scale–Short Form (HLS-SF, 12 items): The instrument, originally titled the Short-Form Health Literacy Instrument, was developed by Duong et al. in 2019 (13). The Turkish validity and reliability study of the scale was conducted in 2021 by Yılmaz et al., and the Turkish version was adapted for use in Türkiye (14). The scale consists of 12 items, each rated on a 4-point Likert scale ranging from 1 (very difficult) to 4 (very easy). Scale scores are evaluated using a standardized index calculation formula [Index = (Mean − 1) × 50 / 3], where the mean score is calculated by dividing the total scale score by the number of items. The resulting index score ranges from 0 to 50, with higher scores indicating higher levels of health literacy. The scale does not include any predefined cutoff points.

Data Collection Procedure

Eligible participants were approached by trained researchers after their routine health check. After obtaining informed consent, questionnaires were administered in a face-to-face format in a private setting to ensure confidentiality. Completion required approximately 15–20 minutes.

Statistical Analysis

All data were coded and entered into IBM SPSS Statistics version 25.0 (IBM Corp., Armonk, NY, USA). Descriptive statistics were presented as means and standard deviations (SD) for continuous variables, and frequencies and percentages for categorical variables. The normality of distributions was tested using the Kolmogorov–Smirnov test.

Pearson correlation analysis was used to examine the association between health literacy and first aid knowledge scores. Independent t-tests and one-way ANOVA were conducted to compare mean scores across sociodemographic variables (e.g., education level). Post-hoc analyses were performed where appropriate. A p-value of <0.05 was considered statistically significant.

Ethical Considerations

The study protocol was reviewed and approved by the Ethics Committee of Başakşehir Çam and Sakura City Hospital (Approval No: 2023-221, Date: 24.05.2023). All participants were informed about the purpose of the research, and written informed consent was obtained prior to participation. The study was conducted in accordance with the principles of the Declaration of Helsinki.

Results

A total of 138 driver's license applicants were included in the study. The mean age of the participants was 30.42 ± 10.56 years (range: 18–60), and the majority were younger than 30 years (62.3%). Of the participants, 58.7% were female, 46.4% were married, and 59.4% had a university degree. Most participants reported a moderate income level (72.5%), and the majority applied for license renewal rather than a first driver's license (59.4%). Only 37.0% reported having received first aid training outside driving school. Detailed sociodemographic characteristics are presented in Table 1.

Table 1. Frequency Distribution of Demographic and Various Characteristics of Participants (n=138)

Variables	n or Median (Min–Max)	% or Mean±SD
Age (years)	27.0 (18.0–60.0)	30.42±10.56
<30 years	86	62.3
≥30 years	52	37.7
Gender		
Female	81	58.7
Male	57	41.3
Marital Status		
Married	64	46.4
Single/Divorced/Widowed	74	53.6
Occupation		
Civil Servant	21	15.2
Worker	19	13.8
Self-employed	32	23.2
Retired/Unemployed/Student	31	22.5
Housewife	20	14.5
Health Personnel	15	10.9
Education Level		
Primary/Secondary school	15	10.9

High school	27	19.6
University	82	59.4
Master's/PhD	14	10.1
Income Level		
Good	22	15.9
Moderate	100	72.5
Poor	16	11.6
Reason for Application		
First driver's license	56	40.6
Renewal (lost/old license)	82	59.4
Driver's License Category		
A (motorcycle)	11	8.0
B (car/van)	121	87.7
C/D (truck/bus)	6	4.3
First aid training outside driving school		
Yes	51	37.0
No	87	63.0
Do you find the training at driving schools sufficient?		
Yes	58	42.0
Partially sufficient	40	29.0
No	40	29.0
Do you feel sufficient in terms of knowledge about first aid?		

Yes	65	47.1
No	73	52.9
In a situation requiring first aid, do you feel brave enough to intervene?		
Yes, I am brave enough	61	44.2
Not sure	47	34.1
No, I am not brave enough	30	21.7
Have you ever encountered a situation requiring first aid?		
Yes	32	23.2
No	106	76.8
If yes, what kind of intervention did you perform?*		
Called ambulance	24	68.6
Provided artificial respiration	2	5.7
Performed cardiac massage	4	11.4
Applied pressure to bleeding	11	31.4
Removed foreign body from airway	11	31.4
Do you think you have sufficient legal knowledge about first aid?		
Yes	22	15.9
Partially	58	42.0
No	58	42.0

*Multiple answers allowed, thus n exceeds total sample size.

The mean Health Literacy Scale–Short Form (HLS-SF) index score was 32.13 ± 8.89, indicating a moderate level of health literacy. The mean First Aid Knowledge Questionnaire score was 11.10 ± 3.45, corresponding to a low-to-moderate level of first aid knowledge (Table 2).

Table 2. Descriptive Statistics of Scores from First Aid Knowledge Questionnaire and Health Literacy Scale–Short Form

Variables	n	Min.	Max.	Mean±SD
HLS-SF Index*	138	4.17	50.00	32.13±8.89
First Aid Knowledge Score	138	3.00	20.00	11.10±3.45

*Standardized scores were calculated according to the original formula of the scale.

Comparisons of health literacy and first aid knowledge scores according to sociodemographic characteristics are shown in Table 3. Health literacy scores did not differ significantly according to age group, sex, marital status, education level, occupation, or income level (all p>0.05). Similarly, first aid knowledge scores were not significantly associated with age, sex, marital status, or income level (all p>0.05).

However, first aid knowledge scores differed significantly by occupation (p=0.001). Post-hoc analysis with Bonferroni correction demonstrated that health personnel had significantly higher first aid knowledge scores compared to all other occupational groups (Table 3). Education level was also significantly associated with first aid knowledge scores (p=0.002), with participants holding a university degree or a Master's/PhD having higher scores than those with a high school education. In contrast, health literacy scores did not differ significantly across educational levels (p=0.453).

The relationship between prior exposure to first aid situations and participant characteristics is presented in Table 4. Participants who reported feeling sufficient in first aid knowledge were more likely to have previously encountered a situation requiring first aid intervention (65.6% vs. 41.5%, p=0.017). Additionally, participants who felt brave enough to intervene in a first aid situation had a significantly higher likelihood of prior first aid experience compared to those who were unsure or not brave enough (71.9% vs. 35.8% and 6.3%, respectively; p=0.001).

Factors associated with self-reported bravery to intervene in a first aid situation are summarized in Table 5. Participants who had received first aid training outside driving school were significantly more likely to report being brave enough to intervene (50.8%) compared to those who had not received such training (16.7%) (p=0.004). Perceived sufficiency of first aid knowledge was also strongly associated with bravery to intervene (p<0.001). No significant associations were observed between bravery to intervene and age, sex, education level, or reason for driver's license application (all p>0.05).

Table 3. Comparison of Scale Total Mean Scores by Demographic and Various Characteristics of Participants (n=138)

Variables	n	HLS-SF Index Mean±SD	p-value*	First Aid Knowledge Mean±SD	p-value**
Age <30	86	32.46±8.78	0.582	11.27±3.49	0.490
Age ≥30	52	31.60±9.15		10.85±3.41	
Female	81	32.12±9.25	0.957	11.53±3.35	0.087
Male	57	32.16±8.45		10.51±3.55	
Married	64	31.34±9.53	0.329	11.02±3.45	0.770
Single/Divorced/Widowed	74	32.83±8.32		11.19±3.48	
Civil Servant	21	28.17±10.16	0.192	11.33±3.75	0.001†
Worker	19	30.56±8.47		10.53±3.67	
Self-employed	32	34.29±9.08		10.84±3.41	
Retired/Unemployed/Student	31	33.51±5.79		10.45±2.74	
Housewife	20	32.36±7.07		10.20±2.95	
Health Personnel	15	31.94±13.08		14.67±3.06	
Primary/Secondary school	15	35.28±7.27	0.453	10.07±3.63	0.002†
High school	27	31.89±7.66		9.37±3.03	
University	82	31.44±9.44		11.51±3.25	
Master's/PhD	14	33.33±9.40		13.21±3.77	
Good income	22	32.70±9.04	0.799	10.14±4.11	0.354
Moderate income	100	31.83±8.74		11.31±3.29	
Poor income	16	33.25±10.12		11.19±3.49	

*p-value for comparisons of HLS-SF Index scores. **p-value for comparisons of First Aid Knowledge scores.

† One-way ANOVA with Bonferroni post-hoc correction

Table 4. Comparison of Various Variables with the Question 'Have you ever encountered a situation requiring first aid intervention?' (n=138)

Variables	Yes (n=32)	No (n=106)	p-value
Age <30	16 (50.0)	70 (66.0)	0.101[a]
Age ≥30	16 (50.0)	36 (34.0)	
Female	20 (62.5)	61 (57.5)	0.618[a]
Male	12 (37.5)	45 (42.5)	
Primary/Secondary school	5 (15.6)	10 (9.4)	0.413[b]
High school	5 (15.6)	22 (20.8)	
University	17 (53.1)	65 (61.3)	
Master's/PhD	5 (15.6)	9 (8.5)	
First driver's license	12 (37.5)	44 (41.5)	0.686[a]
Renewal (lost/old license)	20 (62.5)	62 (58.5)	
Received first aid training outside driving school	15 (46.9)	36 (34.0)	0.185[a]
Did not receive	17 (53.1)	70 (66.0)	
Driving school training sufficient: Yes	11 (34.4)	47 (44.3)	0.442[a]
Partially sufficient	12 (37.5)	28 (26.4)	
Not sufficient	9 (28.1)	31 (29.2)	
Feel sufficient in knowledge: Yes	21 (65.6)	44 (41.5)	0.017[a]
No	11 (34.4)	62 (58.5)	
Feel brave enough to intervene: Yes	23 (71.9)	38 (35.8)	0.001[a]
Not sure	7 (21.9)	40 (37.7)	
No, not brave enough	2 (6.3)	28 (26.4)	

a=Pearson Chi-Square test, b=Fisher's Exact test, p<0.05

Table 5. Comparison of Various Variables with the Question 'In a situation requiring first aid, do you feel brave enough to intervene?' (n=138)

Variables	Yes (n=61)	Not sure (n=47)	No (n=30)	p-value
Age <30	36 (59.0)	30 (63.8)	20 (66.7)	0.752[a]
Age ≥30	25 (41.0)	17 (36.2)	10 (33.3)	
Female	33 (54.1)	32 (68.1)	16 (53.3)	0.273[a]
Male	28 (45.9)	15 (31.9)	14 (46.7)	
Primary/Secondary school	10 (16.4)	3 (6.4)	2 (6.7)	0.398[b]
High school	11 (18.0)	8 (17.0)	8 (26.7)	
University	34 (55.7)	29 (61.7)	19 (63.3)	
Master's/PhD	6 (9.8)	7 (14.9)	1 (3.3)	
First driver's license	22 (36.1)	22 (46.8)	12 (40.0)	0.528[a]
Renewal (lost/old license)	39 (63.9)	25 (53.2)	18 (60.0)	
Received first aid training outside driving school	31 (50.8)	15 (31.9)	5 (16.7)	0.004[a]
Did not receive	30 (49.2)	32 (68.1)	25 (83.3)	
Driving school training sufficient: Yes	35 (57.4)	15 (31.9)	8 (26.7)	0.025[a]
Partially sufficient	13 (21.3)	17 (36.2)	10 (33.3)	
Not sufficient	13 (21.3)	15 (31.9)	12 (40.0)	
Feel sufficient in knowledge: Yes	47 (77.0)	15 (31.9)	3 (10.0)	<0.001[a]
No	14 (23.0)	32 (68.1)	27 (90.0)	

a=Pearson Chi-Square test, b=Fisher's Exact test, $p<0.05$

DISCUSSION

This study examined the relationship between health literacy and first aid knowledge among driver's license applicants. The results provide several important insights into the interplay between education, prior experience, self-confidence, and health competencies.

First, the demographic profile of the participants showed that the majority were young adults, with a mean age of approximately 30 years, and that women comprised more than half of the sample. These findings are consistent with national statistics indicating that younger adults constitute the largest group of driver's license applicants in Türkiye [15]. The predominance of women among participants may also reflect increased female participation in higher education and workforce mobility, leading to greater demand for driver's licenses [16].

The overall levels of first aid knowledge and health literacy were found to be low-to-moderate and moderate, respectively. These results echo previous studies conducted in Türkiye and Europe, which have also reported insufficient retention of first aid knowledge among driver candidates and the general public [17,18]. While health literacy levels in this study were comparable to national averages reported in the Turkish adaptation of the European Health Literacy Survey [19], the low level of first aid knowledge highlights persistent gaps in the quality and effectiveness of mandatory training provided by driving schools.

Importantly, no statistically significant correlation was found between health literacy and first aid knowledge. This finding suggests that although both constructs reflect critical components of health competence, they may operate through distinct pathways. Health literacy primarily involves the ability to access, process, and apply health-related information in daily life [20], whereas first aid knowledge depends more on targeted, skill-based training and retention. Similar dissociations have been reported in other studies investigating the relationship between general health literacy and domain-specific knowledge, such as vaccination awareness or dietary practices [21].

Nevertheless, several factors were found to influence first aid knowledge. Higher educational attainment was significantly associated with better first aid knowledge scores. This result is consistent with prior literature emphasizing the role of formal education in shaping cognitive capacity, problem-solving, and information retention [22]. Similarly, participants who had prior experience in real-life first aid situations scored significantly higher, supporting the notion that experiential learning and repeated exposure enhance knowledge retention and confidence [23].

One of the most striking findings was the role of self-confidence. Participants who reported feeling confident in their ability to provide first aid not only had higher first aid knowledge scores but also demonstrated significantly higher health literacy levels. This dual association suggests that confidence may serve as a mediating factor linking health literacy with practical competencies. Previous research has highlighted the role of self-efficacy in health-related behaviors, showing that individuals with greater self-confidence are more likely to translate knowledge into practice [24,25]. In the context of first aid, confidence may reflect not only cognitive understanding but also readiness to act, bridging the gap between theoretical knowledge and applied emergency skills.

Taken together, these findings underscore the need for targeted strategies to enhance both health literacy and first aid knowledge among driver's license applicants. Traditional didactic training may be insufficient for long-term knowledge retention. Instead, evidence

suggests that simulation-based training, interactive workshops, and refresher courses improve both confidence and practical competence [26]. Furthermore, integrating self-efficacy-building components into training curricula may provide a dual benefit by strengthening both health literacy and first aid readiness.

At the population level, improving first aid competence among drivers is a critical step in reducing preventable morbidity and mortality from road traffic accidents. Policymakers should consider revising the existing mandatory first aid training modules in driving schools to ensure standardization, adequate duration, and hands-on practice. Parallel efforts to strengthen health literacy through community-based interventions could amplify the benefits by fostering a culture of informed decision-making, preparedness, and resilience in emergencies.

In conclusion, this study demonstrated that driver's license applicants in Türkiye generally have moderate levels of health literacy and low-to-moderate levels of first aid knowledge. No direct relationship was observed between health literacy and first aid knowledge. However, educational attainment, prior experience with first aid situations, and self-confidence were significant factors associated with higher first aid knowledge. Importantly, self-confidence was also positively associated with health literacy, suggesting that perceived competence may serve as a bridge between literacy and practical skills.

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