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Examining the Relationship between Health Literacy with Public Health in Employees of Highway and Road Transportation Department of Razavi Khorasan Province in 2023

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ABSTRACT

Background: Promoting the health of society members, especially the workforce, is a top priority for any society. Hence, this study was conducted with the aim of determining the relationship between health literacy with public health in employees of Highway and Road Transportation Department of Razavi Khorasan province in 2023.

Methods: This cross-sectional study was conducted on 121 employees of Highway and Road Transportation Department of Razavi Khorasan province in Iran in 2023. Data collection tools included demographic information questionnaire of employees, health literacy questionnaire, and public health questionnaire. The data were analyzed using SPSS26.00 with a significance level of 0.05.

Result: The mean (SD) health literacy of participants was 111.2 (22.01). The study found that 55.4% of people had medium health literacy, and there was a statistically significant relationship between health literacy and public health ($p < 0.05$). Additionally, there was a statistically significant relationship between education level and health literacy ($p < 0.05$).

Conclusion: The results of the study showed that health literacy is related to public health, so, to improve the public health of employees, their health literacy should be improved, and it is necessary to design interventions to improve the health literacy of employees.

Keywords: Employees, Public Health, Health Literacy

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Introduction

In 1970, the term health literacy was coined and is now an important issue in public health (1). According to the World Health Organization, health literacy is defined as the extent to which an individual possesses the cognitive and social skills to access, interpret, and utilize basic health information and services, enabling them to make informed decisions that promote and maintain good health (2). Limited health literacy is linked to risky behaviors and worse health outcomes, potentially resulting in inadequate disease management, heightened complications, and an increased risk of premature mortality. Furthermore, it can substantially deplete financial resources of a country healthcare system (3). Health literacy is more than just visiting websites, reading pamphlets, and following prescribed health behaviors. This issue includes the ability to apply critical judgment to health information and resources, as well as the ability to interact and express personal and social needs for health promotion (4, 5).

Today, health literacy is not only the ability to read and understand medical prescriptions, but it is a multidimensional concept that has the capacity to reduce health injustice and promote health (6). Thus, health literacy, in its broadest sense, relates to the capacity of individuals, communities, populations, and the health system to respond to the complex demands of health care in modern society (7). Levels of health literacy are strong predictors of individual health outcomes (8).

Health is a person's complete physical, mental, and social well-being that has a mutual and dynamic effect between these three aspects (9). A person has public health who is free from anxiety and symptoms of disability and can establish a constructive relationship with others and cope with the pressures of life (10, 11). Human resources can be considered as the most important development factor in any society, and health literacy is an important factor that affects health, work productivity, and the level of human resource efficiency in any organization (12, 13). Employees are of great importance they are less frequently examined in terms of health and few studies have been conducted on this group. On the other hand, measuring health literacy and investigating factors associated with it are useful and necessary to prevent risks associated with low health literacy by understanding and designing interventions to improve health literacy (14). This study was conducted in Mashhad city, located in Razavi Khorasan province, Iran, approximately 900 kilometers from the capital, Tehran. Mashhad city hosts many pilgrims from all over the country every year, and Road Administration and Transportation Department of Khorasan Razavi Province is one of the largest road administration departments in the country. Undoubtedly, assessing health literacy of these employees and examining its relationship with public health can be effective in planning for health interventions. Therefore, this study aimed to determine the health literacy status of employees of Department of Highways and Road Transport in Razavi-Khorasan Province in 2023 and investigate its relationship with public health.

Methods

This cross-sectional study was conducted on employees of Department of Highways and Road Transport in Razavi-Khorasan Province in 2023. Sampling was done by consensus. The researcher referred to the road department and explained the purpose of the study to employees in the department, and employees who were willing to participate in the study completed the questionnaire.

The inclusion criteria were: to be an employee of Razavi Khorasan Province Highway Department, to be willing to participate in the study, and the exclusion criteria were: not completing the questionnaire and withdrawing from the study. Amongst the 230 employee members of highway department, 121 employees participated in this study.

The instrument used in this study was divided into three parts. The first part was related to the demographic information of employees, including gender, age, marital status, number of children, work experience, and education.

The second part was health literacy

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questionnaire, which was designed and psychometrically evaluated by Modi et al. (15). This questionnaire had a total of 49 questions, of which the first 23 questions werew four-option multiple-choice questions. Correct answers scored 1 point, and wrong answers scored 0 points. Questions 24 to 37 measured the probability of doing certain activities on a Likert scale from very low probability to very high probability (scores 1 to 6), and questions 38 to 42 measured the degree of confidence of a person in performing some health-related activities on a Likert scale from never sure to very confident (scores 1 to 6) and questions 48 and 49 measured people's feelings (pleasant or unpleasant) from being in certain situations on a Likert scale from uncomfortable to very comfortable (scores 1 to 6). The total health literacy score ranged from a minimum of 31 points to a maximum of 149 points. Based on the scores obtained, people with scores below 50% had poor health literacy, between 50% and 75% had average health literacy, and above 75% had good health literacy. CVI of this questionnaire was 83.5%, CVR was 87%, and Cronbach's alpha was 86% (15).

The third questionnaire was General Health Questionnaire (GHQ), containing 28 questions and was designed by Goldberg and Miller. This questionnaire had four subscales, each of which had seven questions. The headings of the scales in this questionnaire were as follows: physical, anxiety and sleep disorder, social behavior, and depression symptoms. In physical symptoms scale section, the overall health status and physical symptoms the individual has experienced over the past month were assessed. In this section, seven questions were asked with the aim of examining the following: feeling of health and well-being, feeling of the need for strengthening drugs in doing things, feeling of weakness, feeling of illness, headache, sensation of pressure in the head, sensation of alternating heat and cold. In the section of anxiety and sleep disorder symptoms, clinical signs and symptoms of severe anxiety, insomnia, stress, anger, and depression in an individual were assessed. The following questions were asked in this section: Insomnia, waking up during the night, sensing under pressure, irritability and mood swings, being scared and panicking, not being able to do things, and depression. In the scale of social action, an individual's capacity to carry out daily activities, sense of fulfillment from completing tasks, sense of usefulness, ability to learn and enjoy daily life activities were studied. The questions asked in this section included the ability to stay engaged and amused, spending more time than normal., feeling positive about activities, feeling satisfied with the way things are done, feeling useful, feeling empowered to make decisions, and enjoying daily activities. In depression symptoms section, feelings of worthlessness, hopelessness, suicidal thoughts, a desire to die, and the capacity to perform tasks were evaluated. The questions examined in this section were feelings of worthlessness, hopelessness, feelings of worthlessness, suicidal ideation, difficulty in performing tasks, wish to die, and attempt suicide. Questions 1 to 7 of this questionnaire were related to physical symptoms, questions 8 to 14 were anxiety and sleep disorder symptom scale, and questions 15 to 21 were related to social behavioral symptoms scale, and questions 22 to 28 were depressive symptom scales. The subject's answers were graded in the form of "0-1-2-3" for the entire test: a score of zero for "more than usual" answers, a score of 1 for "as always" answers, a score of 2 for "less than usual" answers, and a score of 3 was for the answers "much less than usual" where a score of 0-7 in the subscale and a score of 0-22 in the whole questionnaire indicated a favorable situation. A score of 7-11 in the subscale and 23-40 in the entire questionnaire indicated mild symptoms, and a score of 12-16 in the subscale and 41-60 in the entire questionnaire indicated moderate symptoms, and a score of 17-21 in the subscale and 61-84 in the whole questionnaire indicated severe symptoms. This questionnaire was designed by Goldberg (16) and its validation process was carried out in Iran (17).

The questionnaires were provided to the research samples and they were assured about the confidentiality of the information and the optionality of the participation and withdrawal from the study.

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The data were analyzed with SPSS 26.0 statistical software and using descriptive statistical tests, chi-square test and Spearman's correlation coefficient test.

Results

The mean (SD) age of participants in this study was 45.09(6.8) years, 83.5% of participants were male, 90.9% of subjects were married, and 49.6% had a bachelor's degree. Participants had a mean (SD) number of children of 1.9 (1.2) (Table 1).

Table 1. Frequency distribution of demographic factors and their relationship with health literacy

Demographic characteristic		N (%)	Mean (SD)	Health literacy			P-Value*
				Weak	Medium	Good	
Gender	Female	16 (13.2)	114.4 (16.4)	1 (0.9)	9 (7.7)	6 (5.1)	0.824
	Male	101 (83.5)	110.7 (22.9)	11 (9.4)	57 (48.7)	33 (28.2)	
Marital status	Marriage	110 (90.9)	110.2 (22.1)	12 (10.4)	62 (53.9)	35 (30.4)	0.610
	Single	5 (4.1)	119.6 (19.1)	0 (0.0)	3 (2.6)	3 (2.6)	
Education level	<Diploma	1 (0.8)	76.0 (0.0)	1 (0.8)	0 (0.0)	0 (0.0)	0.003
	Diploma	14 (11.6)	102.1 (28.4)	3 (2.5)	8 (6.7)	3 (2.5)	
	Associate Degree	5 (4.1)	126.4 (8.9)	0 (0.0)	1 (0.8)	4 (3.4)	
	Bachelor's degree	60 (49.6)	109.4 (21.2)	5 (4.2)	41 (34.5)	14 (11.8)	
	Master's degree	37 (30.6)	115.9 (20.4)	3 (2.5)	17 (14.3)	17 (14.3)	
	Doctorate	2 (1.7)	123.5 (0.7)	0 (0.0)	0 (0.0)	2 (1.7)	
Age	30-40	35 (28.9)	115.02 (16.3)	2 (1.7)	20 (17.2)	13 (11.2)	0.296
	41-50	48 (39.7)	110.4 (18.2)	4 (3.4)	32 (27.6)	12 (10.3)	
	51-60	32 (26.4)	110.3 (26.9)	5 (4.3)	14 (12.1)	13 (11.2)	
	61-70	1 (0.8)	128.0 (0.0)	0 (0.0)	0 (0.0)	1 (0.9)	
Children	Without children	17 (14.0)	117.7 (20.3)	1 (0.9)	7 (6.1)	9 (7.8)	0.183
	1-2 children	63 (52.1)	113.2 (17.4)	5 (4.3)	39 (33.9)	19 (16.5)	
	3-4 children	32 (26.4)	103.9 (29.9)	6 (5.2)	15 (13.0)	11 (9.6)	
	More than 4 children	3 (2.5)	110.3 (11.5)	0 (0.0)	3 (2.6)	0 (0.0)	
Work experience	7-14	22 (18.2)	113.9 (17.4)	2 (1.7)	12 (10.4)	8 (7.0)	0.515
	15-21	44 (36.4)	112.2 (18.3)	2 (1.7)	29 (25.2)	13 (11.3)	
	22-28	35 (28.9)	110.6 (19.8)	5 (4.3)	18 (15.7)	12 (10.4)	
	29-35	14 (11.6)	103.4 (40.6)	3 (2.6)	6 (5.2)	5 (4.3)	

* chi-square

In this study, there was a statistically significant relationship between education level and health literacy ($p = 0.003$), but other demographic information had no significant relationship with health literacy ($p > 0.05$). Furthermore, no significant relationship was observed between demographic information and public health ($p > 0.05$) (Table 2).

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Table2. Frequency distribution of demographic factors and their relationship with public health

Demographic characteristic		N (%)	Mean (SD)	Public Health				
				Mean (SD)	Mild	Moderate	Severe	P-Value*
Gender	Female	16 (13.2)	114.4 (16.4)	47.8 (7.3)	2 (1.7)	13 (11.3)	1 (0.9)	0.184
	Male	101 (83.5)	110.7 (22.9)	45.8 (9.5)	35 (30.4)	58 (50.4)	6 (5.2)	
Marital status	Marriage	110 (90.9)	110.2 (22.1)	46.5 (9.3)	33 (29.2)	67 (59.3)	7 (6.2)	0.623
	Single	5 (4.1)	119.6 (19.1)	41.2 (3.03)	3 (2.7)	3 (2.7)	0 (0.0)	
Education level	< Diploma	1 (0.8)	76.0 (0.0)	51.0 (0.0)	0 (0.0)	1 (0.9)	0 (0.0)	0.907
	Diploma	14 (11.6)	102.1 (28.4)	44.7 (7.3)	5 (4.3)	7 (6.0)	1 (0.9)	
	Associate	5 (4.1)	126.4 (8.9)	44.0 (5.2)	1 (0.9)	4 (3.4)	0 (0.0)	
	Bachelor's	60 (49.6)	109.4 (21.2)	45.2 (9.3)	21 (17.9)	36 (30.8)	2 (1.7)	
	Master's	37 (30.6)	115.9 (20.4)	48.2 (10.06)	10 (8.5)	23 (19.7)	4 (3.4)	
	Doctorate	2 (1.7)	123.5 (0.7)	40.5 (4.9)	1 (0.9)	1 (0.9)	0 (0.0)	
Age	30-40	35 (28.9)	115.02 (16.3)	44.5 (10.01)	14 (12.2)	19 (16.5)	2 (1.7)	0.651
	41-50	48 (39.7)	110.4 (18.2)	48.1 (8.5)	11 (9.6)	34 (29.6)	3 (2.6)	
	51-60	32 (26.4)	110.3 (26.9)	44.9 (9.3)	12 (10.4)	17 (14.8)	2 (1.7)	
	61-70	1 (0.8)	128.0 (0.0)	45.0 (0.0)	0 (0.0)	1 (0.9)	0 (0.0)	
Children	Without children	17 (14.0)	117.7 (20.3)	44.8 (10.8)	8 (7.1)	8 (7.1)	1 (0.9)	0.482
	1-2 children	63 (52.1)	113.2 (17.4)	44.9 (8.6)	22 (19.5)	38 (33.6)	3 (2.7)	
	3-4 children	32 (26.4)	103.9 (29.9)	48.7 (9.5)	7 (6.2)	20 (17.7)	3 (2.7)	
	More than 4	3 (2.5)	110.3 (11.5)	48.0 (4.5)	0 (0.0)	3 (2.7)	0 (0.0)	
Work experience	7-14	22 (18.2)	113.9 (17.4)	44.7 (10.7)	10 (8.8)	11 (9.7)	1 (0.9)	0.170
	15-21	44 (36.4)	112.2 (18.3)	47.8 (8.2)	9 (8.0)	32 (28.3)	3 (2.7)	
	22-28	35 (28.9)	110.6 (19.8)	45.2 (9.7)	13 (11.5)	20 (17.7)	2 (1.8)	
	29-35	14 (11.6)	103.4 (40.6)	45.9 (9.08)	4 (3.5)	7 (6.2)	1 (0.9)	

* chi-square

Spearman's correlation coefficient test showed that there was a statistically significant relationship between health literacy and public health (p = 0.003).

In this study, the mean (SD) scores of health literacy and public health were 111.2 (22.01) and 46.04 (9.2), respectively. In this study, 55.4% of subjects had moderate health literacy, 46.6% had mild physical symptoms, 49.6% had mild symptoms of anxiety and sleep disorder, 68.6% had moderate symptoms of social functioning, 87.6% had mild symptoms of depression, and 59.5% had moderate symptoms in the public health dimension (Table 3).

Table 3. Levels of public health and health literacy

Public health levels				
Variables	**Favorable situation n (%)**	**Mild symptoms n (%)**	**Moderate symptoms n (%)**	**Severe symptoms n (%)**
Physical symptoms	0 (0)	60 (49.6)	44 (36.4)	13 (10.7)
Symptoms of anxiety and sleep disorders	2 (1.7)	60 (49.6)	40 (33.1)	15 (12.4)
Signs of social action	0 (0)	22 (18.2)	83 (68.6)	12 (9.9)
Symptoms of depression	2 (1.7)	106 (87.6)	6 (5.0)	3 (2.5)
Public health	0 (0)	38 (31.4)	72 (59.5)	7 (5.8)
Health literacy levels				
Variables	Weak n (%)		Medium n (%)	Good n (%)

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Health literacy level	12 (9.9)	67 (55.4)	40 (33.1)

Discussion

The purpose of this study was to determine health literacy status of employees of Department of Highways and Road Transport in Razavi-Khorasan Province in 2023 and to investigate its relationship with public health. If the results of this study indicate that there is a significant positive relationship between health literacy and public health, it means that as health literacy improves, public health will also improve. In 2017, Arbabi et al., (18) in a study titled examining the relationship between health literacy and general health in patients with type 2 diabetes in Zabul, showed that there is a statistically significant and positive relationship between health literacy and general health. They used the test of functional health literacy in adults questionnaire (TOFHLA), which is specific to patients. Reisi et al. (19) conducted a study on the elderly in Isfahan city and reported that there is a positive and significant relationship between general health and health literacy, which is similar to Arbabi's study (18). In their study, TOFHLA questionnaire was also used. The difference between the present study and these two studies (18, 19) is the use of different questionnaires. Also, this study was conducted on the employed workforce, and the significant and positive relationship between health literacy and public health can be an option in health promotion interventions.

Bakhshalipour et al. (20) also conducted a study in 2022 on inactive employees of Bagherol Uloom Marine Science Education Center and found a significant relationship between health literacy and general health. The target group of this study was different from the present study. Another difference between this study (20) and the current study is the health literacy questionnaire. In the study of Bakhshalipour et al., (20) the Health Literacy for Iranian Adults (HELIA) questionnaire was used to check the health literacy of employees, which is different from the questionnaire used in the present study. In a study conducted by Ghanbari et al. (21) to examine the relationship between health literacy and the health status of administrative staff at Gilan University of Medical Sciences, they presented different results from our study and the aforementioned studies (18-20). In the study by Ghanbari et al., (21) no statistically significant relationship was observed between health literacy and employee's health status. However, in this study (21), the GHQ was not used, but (5) a five-point Likert scale and the health literacy questionnaire were used. Helia's questionnaire is easier to answer than a number of health literacy questionnaires (22). Health indeed, health literacy is an intermediate determinant of health, but it is not a panacea for health inequalities caused by misallocation of opportunities and resources (3). In an integrative review study, Stormacq et al. (23) showed that health literacy is the link between socio-economic status and health. In the perspective of the health system map of the Islamic Republic of Iran in 2025, health literacy is clearly mentioned. Therefore, improving the health literacy of Iranian society is on the agenda (24).

In this study, the mean (SD) score of health literacy of the participants was 111.2 (22.01), which was compared to Modi's study (15) that used the same questionnaire and the mean (SD) score of health literacy was 109.6 (21.71), indicating a higher level. The target group of the two studies was different from each other. In the present study, the target group included employees of the highway department, and in Modi's study (15), the target group of the study was the population covered by the family doctor of Askarieh Rural Health Center. In these two studies, almost half of subjects had an average level of health literacy. In the Modi's study, 21.2% of the participants had poor health literacy, but in the present study, only 9.9% of the people had a poor level of health literacy. Since the target group in our study is employees, a higher level of health literacy is expected. In the study of Khoshravesh et al., (25) which examined the health literacy of employees, although the HELIA questionnaire was used in their study, 46.3% of the participants had borderline health literacy (25). In the study of Mehdifar et al. (26)

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which investigated the health literacy of health care employees in Binalud, 56.6% of participants had sufficient health literacy. However, considering that a higher level of health literacy is expected from health care employees, the difference in health literacy level of these employees compared to the employees in the present study can be justified, although the questionnaires used in these two studies are different.

In the present study, the only demographic characteristic that was related to health literacy was the level of education, and this is in accordance with the results of studies of Moodi et al. (15), Khoshravesh et al. (25), Mahdifar et al. (26), Raeisi Yekta et al. (27), Tosan et al. (28), and Changizi et al. (29). An integrative review study also showed that academic achievement is the most important determinant of health literacy (23). Hence, it seems that education provides more opportunities for understanding, evaluating, and making correct decisions about health and creates a more favorable environment for increasing health literacy and applying the acquired information. There was no statistically significant relationship between age and health literacy in the current study, which is consistent with studies by Raeisi Yekta et al. (27) and Charoghchian et al. (30). However, in studies by Khoshravesh et al. (25), Tosan et al. (28), and Changizi et al. (29), age had a statistically significant relationship with health literacy. In our study, gender had no significant relationship with the level of health literacy. In studies by Mahdifar et al. (26), Raeisi Yekta et al. (28), and Khoshravesh et al. (25), no significant relationship was observed. However, in the study by Changizi et al. (29), there was a significant relationship between gender and health literacy.

In the current study, there was no significant relationship between marital status and level of health literacy, which is in line with studies by Mehdifar et al. (26) and Changizi et al. (29). However, in studies by Khoshravesh et al. (25) and Tosan et al. (28), marital status was associated with health literacy. In our study, the number of children did not have a significant relationship with health literacy, which is consistent with studies of Mahdifar et al. (26) and Charoghchian et al. (30). However, in the study by Tosan et al. (28), there was a statistically significant relationship between the number of children and health literacy. Different target groups and health literacy questionnaires and cultural and social variables might be the reason for the difference in results.

It should be noted that one of the limitations of this study is the use of self-report by employees in completing the questionnaire. Another limitation is that some employees declined to participate due to their busy schedules and unwillingness to participate in the study. It should also be noted that this study was conducted on employees of Highway and Road Transportation Department of Razavi Khorasan province, so generalization of the results to other groups and employees should be avoided.

Conclusion

The results of this study showed that health literacy is related to general health and the only variable that is related to health literacy is education; therefore, improving the level of education of employees can be effective in improving their health literacy. On the other hand, it is suggested that educational interventions aimed at improving the health literacy of employees be carried out in different departments.

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Conflict of interest

The authors declare no conflict of interest.

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Ethical considerations

Written informed consent was obtained from each participant.

Code of Ethics

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Authors' Contributions

Authors E. Ch. Kh, designed the study; N.A, performed the study; H. T, N. P and M. Gh, participated in the conception of the study; E. Ch. Kh, managed and conducted the statistical analyses and interpreted the data; E. Ch. Kh wrote manuscript.

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