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**Title:** Knowledge and Attitude of Pre-Hospital Emergency Workers Regarding Professional Legal Issues: A Cross-Sectional Study

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## Abstract

**Background:** Emergency Medical Services, more commonly known as EMS, is the first level of health care. The first step to be protected against legal traps is to gain the due legal knowledge. The current study pursued the goal to survey the knowledge and attitude of pre-hospital emergency workers regarding professional legal issues at Mazandaran University of Medical Sciences in Iran.

**Materials and Methods:** This is an analytical, cross-sectional study conducted in 2021. The study statistical community included all emergency medical staff working in headquarters and the personnel of Emergency Service Centers of 115 and the emergency staff of Mazandaran province. The data were collected by a researcher-built questionnaire about the status of knowledge and attitude of emergency medical service staff considering legal issues. To study the relationship between the scores of knowledge, attitude, Pearson's correlation was used and to evaluate the factors influencing the score of knowledge, attitude, multiple linear regression was employed. SPSS-22 was used for data analysis and significance level 0.05 was considered.

**Results:** The study consisted of 267 participants whose mean age was  $33.31 \pm 6.99$  yrs. The majority of the participants were men (88%) and married (79.8%). The variables including marital status, education, the type of employment, service base, presence in judicial communities, age and work experience revealed to be meaningfully related with the score of attitude. In terms of knowledge, 77.9% of the staff were at satisfactory level. Considering attitude, 55.4% were at good level.

**Conclusion:** The level of legal knowledge and attitude of pre-hospital emergency workers was at favorable level. However, it is recommended to organize training courses as clinical scenarios in order to increase and update the information on the criminal and penal codes relevant to the profession. Therefore, it is suggested to identify the legal challenges of pre-hospital emergency workers.

**Keywords:** Knowledge, Attitude, Laws, Medical Services, Prehospital Emergency Care

## **Introduction**

The knowledge of the rules and regulations governing a job and profession grants a person the opportunity to gain more power(1). Since careers related to medical sciences are required to play a role in promoting the health of society, they must comply with the rules of compliance, responsibility, and accountability(2). In the health team, the first encounter with new legal cases occurs with pre-hospital emergency workers(3). Despite the efforts of physicians, nurses, and other employees of the healthcare sector, and in spite of extensive facilities, the level of dissatisfaction and complaints from patients has increased, leading to numerous legal cases against nurses and other medical staff(4). Pre-hospital care is typically provided via the Emergency Medical System (EMS), which deals with a wide variety of illnesses, including communicable infections, non-communicable diseases, childbirth, and traumas. All of these conditions may be reported to the EMS in the acute phase or in their natural manifestations(5). The EMS is part of the community and functions as an emergency response network. It has a moral obligation to respond to emergencies regardless of the patient's earning potential or social status. Care should not be unfairly confined to a particular group or class of people(6). Today, because of patients' increasing knowledge of their rights to receive safe care, nurses face legal issues in this respect. It is evident that to provide safe care, nurses must be aware of professional rules and regulations to protect themselves and their patients(7). The law always regulates relations and how to treat each other, and obeying the law is one of the inevitable subjects in all social relations(8). Extensive professional rules outline the practice and boundaries of each profession; thus, familiarizing workers with the rules governing their profession can prevent faults and help maintain the quality of services(9). The EMS is the first level of healthcare provided in emergency medical wards outside the hospital(10). Its goal is to provide care, guarantee the immediate transfer of patients, and reduce mortality. Under unpredictable hazardous care settings, pre-hospital emergency workers often face conditions that expose them to extreme pressure for making decisions, particularly when confronted with ethical challenges(11). Compared to other paramedical specialists, EMS workers have to deal with different decision-making conditions in terms of the medical care context. Suing for the faults of the medical team and the medical staff is one of the most critical stressors in the professional lives of doctors and health team personnel, and failure to pay attention to the factors behind its outbreak has adverse effects on the quality of services provided by the health team and indirectly

affects people's health(12). When a member of the health team faces a legal complaint from a patient, they may distrust their beliefs and feel their social dignity is at risk, which induces anxiety, depression, and even illness(13). Most studies regarding nursing care have reported deficiencies in this respect and recommended the need for effective training for nurses (14). Having knowledge about a subject enhances attitudes toward that subject, and carrying out any responsibility properly demands a positive attitude toward that subject (15). Therefore, the first step to avoid falling into legal traps is to have the necessary knowledge about the law. (7). In a study conducted by Ascı et al., it was reported that 25% of EMS workers had no knowledge of how to protect and report legal evidence (16). Legal aspects refer to how different issues pertain to the law (17). One of the main reasons for the increase in complaints against medical staff is their lack of awareness of legal issues, professional regulations, and their responsibilities toward patients. With the advancement of medicine and the increasing complexity of ethical issues, familiarity with relevant laws seems essential. Since pre-hospital emergency personnel across the country face challenges such as medical errors, negligence, and patient complaints, acquiring specialized knowledge in this field is crucial. Familiarity with these regulations not only improves the quality of services but also protects patients' rights. Therefore, given the importance of this issue and the lack of research in this area, the present study aimed to examine the knowledge and attitudes of pre-hospital emergency personnel at Mazandaran University of Medical Sciences regarding professional laws.

### **Materials and Methods:**

This research is analytical and cross-sectional. The study's statistical community included all emergency medical staff working in urban, roadside, air, and coastal headquarters, as well as the personnel of Emergency Service Centers of 115 and the emergency staff of Mazandaran province in Iran.

Pursuant to the study's goal, the sampling method was census. The study's inclusion criteria were having at least an associate degree, at least one year of work experience, and presenting informed consent to participate in the study. The exclusion criteria included reluctance to participate in the study and not fully completing the questionnaires.

The primary collected data included the demographic information form, age, gender, marital status, education, the record of being summoned to judicial authorities, the history of

participation in training workshops, and professional information such as work experience, service base, position in the workplace, type of shift, and employment type.

To evaluate the level of knowledge, a 40-item researcher-built questionnaire was developed, with scoring as follows: 1 point for every correct answer and 0 points for every incorrect answer. The second part of the attitude questionnaire consisted of 10 items, with scoring done on a 5-point Likert scale ranging from absolutely agree (5 points) to absolutely disagree (1 point), which evaluated the attitude of EMS workers towards compliance with professional rules and regulations (supplementary file). Overall, higher scores in knowledge and attitude indicated a more favorable status.

The questionnaire's face validity and content validity were measured through experts' opinions (from 10 faculty members with extensive experience in EMS) and using CVI and CVR indices ( $CVR > 0.6$ ,  $CVI > 0.79$ ). In addition, the questionnaire's reliability was examined using Cronbach's alpha and test-retest methods (with 30 EMS employees) after two weeks. Cronbach's alpha coefficient was estimated at 0.79 for knowledge and 0.7 for attitude.

In the stage of gathering information, after coordination, it is necessary for researchers to enter the relevant units, introduce the research units, state the purpose of the research, and obtain their consent to participate in the research. They obtained the signature of a written consent form.

To analyze the data, mean, standard deviation, frequency, and percentage were used to describe quantitative and qualitative variables. The Kolmogorov-Smirnov test was employed to test for normality. When the normality test was verified, independent t-tests, ANOVA, multiple linear regression, and Pearson's correlation coefficient were employed for statistical inference. SPSS-22 was used for analysis, and a significance level of 0.05 was taken into account.

## **Result**

This study consisted of 267 participants, with a mean age of  $33.31 \pm 6.99$  years, and a minimum and maximum age of 23 and 53 years, respectively. The majority of the participants were male (88%) and married (79.8%). Table 1 displays the other descriptive information. Additionally, the participants' mean work experience was  $6.42 \pm 8.96$  years, with a minimum of 1 month and a maximum of 28 years.

**Table 1:** Participants' descriptive information

Variable		N(%)	Variable		N(%)
<b>Gender</b>	Man	235(88.0)	<b>Service base</b>	Urban	109(41.1)
	Woman	32(12)		Roadside	106(39.8)
<b>Marital status</b>	Married	213(79.8)		Staff	22(8.2)
	Single	54(20.2)		Emergency service center of 115	12(4.5)
<b>Education</b>	Associate degree	84(31.5)		Other (air-costal)	17(6.4)
	Bachelor's degree	147(55.1)	<b>Attendance at judicial authorities</b>	No	175(65.8)
	Higher education	36(13.4)		Yes	91(43.2)
<b>Employment type</b>	Registered	119(44.6)	<b>Information collection source</b>	Cyberspace	102(38.5)
	Temporary	65(24.3)		Article	29(10.9)
	Contractual	35(13.1)		Conference	33(12.5)
	Corporate	23 (8.6)		The heads of departments	101(25.1)
	Planned forces	25 (9.4)	<b>Workshop participation</b>	No	67(25.1)
<b>Shift type</b>	Fixed	94(35.7)		Yes	200(74.9)
	Rotating	169(64.3)			
<b>Insurance coverage</b>	No	18(6.8)			
	Yes	247(93.2)			

The mean score of knowledge was  $31.28 \pm 5.38$ , with a minimum and maximum score of 18 and 40. Finally, 22.1% of the staff had average knowledge (13.3-26.7), and 77.9% had satisfactory knowledge (26.8-40). additionally, the mean score of attitude was  $34.79 \pm 4.66$ , with a minimum

and maximum score of 21 and 46. In terms of attitude level, 44.6% were at the average level (16.7-33.3), and 55.4% were at the satisfactory level (33.4-50). Table 2 depicts the relationship between the scores of knowledge and attitude, and the study variables were analyzed univariately. As the table indicates, the variables of education, service base, presence in judicial authorities, age, and work experience duration had a meaningful association with the score of knowledge. Moreover, the variables of marital status, education, type of employment, service base, presence in judicial authorities, age, and work experience duration had a significant relationship with the score of attitude. A significant correlation coefficient (0.35) was also reported between the scores of knowledge and attitude, and the increasing score of knowledge led to an increase in the attitude score.

**Table 2:** Relationship between knowledge & attitude and study variables

Qualitative variables		Knowledge		Attitude	
		mean±sd	p-value	mean±sd	p-value
<b>Gender</b>	Man	31.48±5.35	0.095 <sup>+</sup>	34.78±4.71	0.945 <sup>+</sup>
	Woman	29.80±5.24		34.84±4.31	
<b>Marital status</b>	Married	31.59±5.28	0.066 <sup>+</sup>	35.13±4.44	0.019 <sup>+</sup>
	Single	30.08±5.54		33.46±5.26	
<b>Education</b>	Associate degree	28.92±5.31	<0.001 <sup>*</sup>	33.18±4.45	<0.001 <sup>*</sup>
	Bachelor's degree	32.53±4.76		35.08±4.64	
	Master's degree	32.53±4.76		37.36±3.80	
	Higher education	31.68±6.03		37.36±3.80	
<b>Employment type</b>	Registered	32.24±5.47	0.051 <sup>*</sup>	36.50±4.34	<0.001 <sup>*</sup>
	Temporary	30.83±5.47		33.68±5.29	
	Contractual	29.38±4.72		32.60±3.82	
	Corporate	30.35±4.75		33.35±2.87	



	Planned forces	31.36±5.23		33.92±4.15	
<b>Shift type</b>	Fixed	31.89±5.80	0.271 <sup>+</sup>	35.33±4.80	0.159 <sup>+</sup>
	Rotating	30.93±5.10		34.48±4.61	
<b>Insurance coverage</b>	No	31.72±6.51	0.741 <sup>+</sup>	36.50±3.97	0.110 <sup>+</sup>
	Yes	31.29±5.28		34.68±4.70	
<b>Service base</b>	Urban	31.99±5.20	<0.001 <sup>*</sup>	35.0±4.41	0.004 <sup>*</sup>
	Roadside	31.51±5.24		34.87±4.96	
	Staff	32.77±6.11		36.95±4.86	
	Medical service center of 115	27.42±2.64		31.42±3.03	
	Other (air-coastal )	26.47±3.89		32.65±3.30	
<b>Attendance at judicial authorities</b>	No	32.50±5.19	<0.001 <sup>+</sup>	35.75±4.72	<0.001 <sup>+</sup>
	Yes	29.01±4.91		33.0±3.95	
<b>Information collection source</b>	Cyberspace	30.17±5.66	0.050 <sup>*</sup>	34.23±4.67	0.050 <sup>*</sup>
	Article	31.21±6.41		33.41±5.38	
	Conference	32.06±5.26		34.61±5.57	
	The heads of departments	32.21±4.55		35.67±3.84	
<b>Workshop participation</b>	No	31.46±5.16	0.756 <sup>+</sup>	34.60±4.50	0.696 <sup>+</sup>
	Yes	31.22±5.36		34.86±7.20	
<b>Quantitative variables</b>		<b>r</b>	<b>p-value</b>	<b>r</b>	<b>p-value</b>
<b>Age</b>		0.26	<0.001 <sup>++</sup>	0.26	<0.001 <sup>++</sup>
<b>Work experience duration</b>		0.22	<0.001 <sup>++</sup>	0.35	<0.001 <sup>++</sup>
<b>Knowledge</b>		-	-	0.54	<0.001 <sup>++</sup>

<sup>+</sup>: Independent t-test    <sup>\*</sup>: ANOVA

<sup>++</sup>: Pearson's correlation coefficient test

Table 3 reports the factors affecting the knowledge score using linear regression. An increase of one year in age results in a knowledge score increase of 0.15. The mean knowledge score of individuals with a bachelor's degree and higher education was reported as 3.30 and 2.42 units more than that of participants with an associate degree. Contractual personnel had a lower knowledge score (2.34 units) than registered personnel. Additionally, nurses with rotating shifts had a lower knowledge score (1.48 units) than those with fixed shifts. The knowledge scores of staff and air-coastal workers were 3.62 and 4.94 units lower than those of urban base personnel, respectively. The knowledge of personnel with a record of attending judicial authorities received a lower score (2.26 units). Other variables revealed no significant relationship with the knowledge score.

**Table 3:** Factors influencing score of knowledge by multiple linear regression

<b>Variable</b>		<b>B</b>	<b>se</b>	<b>p-value</b>
<b>Age</b>		0.15	0.06	0.007
<b>Education</b>	Associate degree	3.30	0.74	<0.001
	Bachelor's degree	2.42	1.07	0.025
	Higher education			
<b>Employment type</b>	Registered			
	Contractual	-2.34	1.01	0.020
<b>Shift type</b>	Fixed			
	Rotating	-1.48	0.67	0.029
<b>Service base</b>	Urban			
	Staff	-3.62	1.33	0.007
	Air-coastal	-4.94	1.49	0.001
<b>Attendance at judicial authorities</b>	No			
	Yes	-2.26	0.66	0.010

Table 4 displays the factors influencing the attitude score using linear regression. The mean attitude score for participants with higher education was 2.99 units higher than that of those with an associate degree. The staff who had contractual, temporary, and planned employment received lower attitude scores (2.31, 4.27, and 2.44 units, respectively) than the registered workers. The mean attitude score of the staff with a history of attending judicial authorities was 2.32 units lower than that of others. Other variables revealed no significant relationship with the attitude score.

**Table 4:** Factors influencing score of attitude using multiple linear regression

Variable		B	se	p-value
Education	Associate degree			
	Higher than bachelor's degree	2.99	0.91	0.001
Employment type	Registered			
	Temporary	-2.31	0.66	0.001
	Contractual	-4.27	0.86	<0.001
	Planned forces	-2.44	0.99	0.014
Attendance at judicial authorities	No			
	Yes	-2.32	0.58	<0.001

## Discussion

The current research was conducted with the goal of investigating the knowledge and attitude of pre-hospital emergency workers regarding professional rules and regulations at Mazandaran University of Medical Sciences. The findings revealed that 77.9% of the workers had satisfactory knowledge and 55.4% had a good attitude level. No study was found addressing the knowledge and attitude of pre-hospital emergency workers. Araghian et al. (2020) reported that the knowledge and attitude of nurses were at a satisfactory level concerning legal issues in

medical training centers of Mazandaran University of Medical Sciences (18). However, in a study conducted in 2018 on the knowledge and attitude of nurses about legal aspects, only 49% of nurses had poor knowledge and 44% had moderate knowledge (19). A positive attitude and knowledge about legal issues lead them to perform their duties within the framework of regulations, obeying which results in fewer consequences for technicians. In this respect, they can defend themselves by resorting to the law, but referring to the law or considering moral values in decision-making depends on the circumstances at the scene. Due to reasons such as pressure from relatives, ensuring security, and lack of support from the system, emergency service workers were sometimes forced to transfer patients and perform interventions that were beyond the confines of their responsibility. For instance, as a result of a patient's family request at the scene, some EMS personnel perform interventions and CPR despite signs of imminent death or in cases where the family knows that the patient doesn't need CPR (20). Thus, strict adherence to the law can sometimes be contrary to the requests of patients, families, and even the personnel's inner feelings. To avoid the consequences of their decisions, nurses sometimes prefer to be law-abiding rather than listen to their inner voice (21).

According to the findings of the study, the variables of education, service base, attendance at judicial authorities, age, and work experience duration were significantly associated with the knowledge score. Additionally, the variables of marital status, education, type of employment, service base, presence in judicial authorities, age, and work experience length had a significant relationship with the attitude score. No study has been conducted in this regard on pre-hospital emergency workers for comparison, but in a study conducted by Malarvizhi et al. (2015), the nurses' knowledge level displayed a significant relationship ( $p < 0.05$ ) with the variables of age, education, work experience, and organizational position ( $p > 0.05$ ) (22).

In the study conducted by Araghian et al., the nurses' age and clinical experience had a critical relationship with attitude, such that as age or work experience increased, the nurses' attitude score also increased (18). The results of the research conducted by Rashidi et al. (2017) reported that the mean score of knowledge in subjects over 40 years old was significantly higher than that of those under 40 years old. It is expected that with increasing age, the necessity and importance of knowledge about professional laws will become more evident for nurses, prompting them to make greater efforts to enhance their professional knowledge in this area. Furthermore, the mean score of knowledge in ICU nurses with work experience of eight years or more was significantly

higher than the mean score of knowledge of nurses with less than eight years of work experience (23).

The results of the study by Omidi et al. (2020) indicated no significant relationship between age and work experience and knowledge about professional rules among midwives in the maternity ward (24). In research performed by Khulpuwa Maring (2019) in the specialized ward of obstetrics and gynecology in India, a relationship was found between clinical history in the obstetrics and gynecology ward and the level of knowledge about professional rules (25).

The present study reported that the education of pre-hospital emergency workers has a tangible relationship with their knowledge and attitude. The mean score of knowledge for subjects with a bachelor's degree and higher education was 3.30 and 2.42 units higher than that of participants with an associate degree. The mean score of attitude for subjects with higher education was 2.99 units higher than that of those with an associate degree. In the study conducted by Ibrahim et al. (2019), nurses with a master's degree had more knowledge about professional rules than those with a diploma (26).

In this research, contractual personnel had a lower score of knowledge (2.34 units) than registered personnel. Those with temporary, contractual, and planned force employment received lower scores of attitude (2.31, 4.27, and 2.44 units, respectively) than registered personnel. The study by Malarvishi et al. (2015) indicated that the knowledge level of nurses was significantly associated with variables such as age, education, work experience, and organizational position ( $p < 0.05$ ) (22). In addition, a meaningful correlation coefficient (0.35) was reported between the scores of knowledge and attitude of pre-hospital emergency workers, indicating that an increase in the score of knowledge results in a higher score of attitude. Also, nurses working in rotating shifts had a lower score of knowledge (1.48 units) than those with fixed shifts, the results of which are consistent with the study of Sedghi Sabet et al. (8), who investigated the status of knowledge and adherence to legal aspects and its pertinent factors among nurses, which can result from greater interaction between coworkers and managers and a higher number of experienced nurses working in morning shifts.

The knowledge score of the staff and air-coastal workers was 3.62 and 4.94 units lower than that of urban base workers, respectively. More studies are required in this area due to the lack of similar studies.

The knowledge score of personnel with a history of attending judicial authorities was lower (2.26 units). Other variables did not reveal any significant relationship with the score of knowledge. The mean score of attitude for personnel who had a history of attending judicial authorities was 2.32 units lower than that of others. Other variables showed no significant relationship with the score of attitude. It appears that nurses with lower knowledge are more involved in legal cases, which necessitates further studies to prove this claim.

The results of a qualitative study conducted on the challenges of pre-hospital emergency workers in 2023 showed that management challenges, professional problems, and cultural barriers are among the main concerns of EMS workers. Additionally, lack of organizational support and ambiguity in professional roles and duties in their performance are considered very important (27). There is a need to create a comprehensive plan to reduce the legal challenges faced by pre-hospital emergency workers.

In the current study, data collection was done through self-reporting, which may affect data validity. It is recommended to conduct a qualitative study about the legal challenges of personnel working in emergency medical centers.

This study was conducted on emergency medical staff working in urban, roadside, and air-coastal headquarters, as well as the personnel of Emergency Service Centers of 115 and the emergency staff of Mazandaran province. It is recommended to conduct further studies in other universities of medical sciences.

## **Conclusion**

Regarding the satisfactory level of knowledge and attitude of pre-hospital emergency workers in the present study, it's still necessary for them to increase their legal information. Since pre-hospital emergency personnel's knowledge of professional rules is a must to provide safe health care, the senior executives are advised to take the necessary intervention measures in order to raise their knowledge and hold re-training courses based on novel educational methods so that to have sufficient up-to-date knowledge about professional rules. And it's also recommended that the cases of complaints sued against pre-hospital emergency workers in judicial courts be considered in the form of a scenario being deeply analyzed in terms of faults in permanent educational programmes. Conducting qualitative research can help understand the challenges

faced by pre-hospital emergency workers regarding professional legal and penal laws. Regarding the satisfactory level of knowledge and attitude of pre-hospital emergency workers in the present study, it is still necessary for them to increase their legal information. Since pre-hospital emergency personnel's knowledge of professional rules is essential to providing safe health care, senior executives are advised to take the necessary intervention measures to enhance their knowledge and hold re-training courses based on novel educational methods to ensure they have sufficient up-to-date knowledge about professional rules. It is also recommended that the cases of complaints filed against pre-hospital emergency workers in judicial courts be considered in the form of scenarios that are deeply analyzed in terms of faults in permanent educational programs. Moreover, they are advised to conduct qualitative research to identify the challenges faced by pre-hospital emergency workers regarding professional legal and penal laws.

## **Ethical Considerations**

### **Compliance with ethical guidelines**

After receiving the code of ethics IR.MAZUMS.REC.1400.127, the researcher was officially introduced to the pre-hospital emergency research departments through a letter of introduction from Mazandaran University of Medical Sciences. The researcher was introduced to the head of pre-hospital emergency and research in Mazandaran province and the confidentiality of the information was ensured. The researcher respected honesty and trust in data collection and use of sources.

### **Abbreviations**

EMS stands for Emergency Medical Services.

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### **Authors' Contributions**

All authors have read and approved the manuscript. TY, AK: designing the study: HN, AK, FAM: collecting and analyzing the data, TY, FAM: preparing the manuscript

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**Availability of Data and Material**

The datasets used and/or analyzed during the current study are available from the corresponding author if requested.

**Declarations**

Ethics approval and consent to participate

This study is the fruit of the research project of Mazandaran University of Medical Sciences with ethics code as IR.MAZUMS.REC.1400.127. To ensure anonymity and confidentiality, patient records/information were de-identified before analysis. This study also complies with the Declaration of Helsinki.

**Conflicts of Interest**

The authors stated no conflict of interest.

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