Article

Trust levels of patients in emergency medical technicians, associated factors, and resulting outcomes

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Abstract

Background: Trust between patients and Emergency Medical Technicians (EMTs) is crucial for effective pre-hospital nursing care.

Objectives: This study aimed to assess the trust levels of patients in emergency medical technicians, associated factors, and resulting outcomes.

Methods: This cross-sectional study was conducted on 400 patients transported by EMTs to the emergency departments of teaching hospitals in Zanjan City during 2023-2024. Data collection tools included demographic questionnaires, the Patient Trust Questionnaire (PTQ), a Visual Analog Pain Scale (VAS-P), and a Visual Analog Scale for Anxiety (VAS-A). Data were analyzed using SPSS version 24 software. Pearson's correlation, multiple regression, and simple linear regression statistical tests were conducted, with a significance level of less than 0.05.

Results: Patients had a mean (SD) trust level of 4.11 (0.92) in EMTs. Patients' trust could be predicted by factors such as the speed of EMTs' performance, reason for calling EMS, place of residence, and education (R=0.42, Adjusted R Square=0.17). The trust variable predicted anxiety, in patients. (p<0.05).

Conclusion: Trust in pre-hospital care helps manage patients' mental conditions. EMTs play a crucial role in building patients' trust during emergencies.

Implications of this paper in nursing and midwifery preventive care:
- When patients trust emergency medical technicians, it improves their clinical outcomes.
- As patients' trust in emergency medical technicians increases, patients' anxiety decreases.

Introduction

Emergency medical services (EMS) are at the forefront of the healthcare system. EMS is responsible for providing care to emergency patients and immediate transfer of patients to reduce mortality [1]. Patients transported by EMS require safe and reliable care [2]. Providing quality services and ensuring patient comfort are important tasks of the EMS [3,4]. Building trust between staff and patients is a key factor in improving the quality of care [5]. Establishing a good relationship with the patient and understanding their needs is the first step in building trust for a nurse [6]. Trust involves behaviors that benefit the patient, like loyalty and honesty. EMTs need to pay special attention to anxious and in pain patients in the ambulance [7]. One important measure of EMS quality is pain management by EMTs. The presence of severe pain in a patient can cause worry and anxiety, as it may suggest a serious disease or the possibility of death [8]. Effective clinical symptom control and management can impact patient prognosis, including pain and anxiety [9,10]. Patients with lower anxiety levels are more involved in their treatment and have better mental health outcomes [10]. A trusting relationship between patients and healthcare providers can lead to lower treatment costs and better clinical outcomes. Trust in healthcare providers is the main factor in increasing the quality and satisfaction of patients [11]. Improving patient comfort and trust can enhance healthcare provider-patient relationships and promote proper pain management [7]. According to a study, patients who do not receive appropriate treatment tend to trust healthcare providers less [12]. It has been observed that there is a direct correlation between increasing trust and

decreasing anxiety in patients [13]. The patient's lack of trust in healthcare providers can result in violent behavior and suspicion towards their performance [14].

After conducting a review of the literature, it was found that most studies on the relationship between patients' trust in healthcare professionals and their clinical outcomes were done in a hospital setting. Because of the critical nature of patients' conditions, trust in EMTs is essential. Improved cooperation with EMTs can be achieved through patients' trust. There has been less research on the trust between EMTs and patients in pre-hospital emergencies. Therefore, this study aimed to assess the trust levels of patients in emergency medical technicians, associated factors, and resulting outcomes.

Methods
This cross-sectional study was carried out between August 3, 2023, and March 3, 2024. The research was carried out in the emergency departments of Ayatollah Mousavi and Vali Asr of Zanjan City. This study included patients who were transferred by EMTs to the emergency departments of these two hospitals. To estimate the sample size, a pilot study was conducted with 30 patients. G*power software predicts that 376 people need to be included in the sample, assuming α = 0.05 and d = 0.17. In the current study, 400 patients were considered with a dropout rate of 5%. Inclusion criteria included willing patients transported by EMTs who could communicate verbally. Patients with reduced consciousness, life-threatening conditions requiring immediate transfer to the operating room, and mental or psychological disorders reported by the patient or companion were not included in the study.

Data were collected using demographic and clinical information form, patient trust questionnaire (PTQ), visual analog scale of pain (VAS P), and visual analog scale of anxiety (VAS A).

Demographic and clinical forms included various topics such as age, gender, education, health insurance, additional service insurance, chief complaint, underlying diseases, hospitalization history, and recent use of EMS services.

The Patient Trust Questionnaire (PTQ) was developed by Norberg Boysen et al. in 2016 in Sweden to measure patient trust. It was administered to 427 patients [15]. Permission was obtained to use the questionnaire tool developers. The questionnaire's validity was determined by surveying ten experts in instrumentation and emergency fields. The questionnaire had a Content Validity Ratio (CVR) of 0.67 and a Content Validity Index (CVI) of 0.86. Its construct validity was evaluated through AMOS software and was found to be valid. Additionally, Cronbach's alpha was used to determine the reliability of the questionnaire in this study and it resulted in a score of 97%. The questionnaire has 8 items, divided into credibility and accessibility dimensions. Each dimension has 4 items rated on a Likert scale ranging from 1 (disagree) to 5 (strongly agree). Items 5 to 6 are graded in reverse order. A score of less than 3 indicates low trust and a score above 3 indicates high trust.

The VAS-P is a widely used tool for measuring pain intensity. This tool has been proven to be highly reliable and valid in its results [16]. The system is uncomplicated and linear, comprising a single 10 cm line that can be vertical or horizontal. This scale is self-administered, and the respondents are instructed to mark a line perpendicular to the VAS line that represents their level of pain intensity.

A tool for assessing anxiety levels consists of a horizontal line measuring 100 mm in length. Facco et al. (2013) conducted a study to validate the tool's effectiveness in measuring preoperative anxiety levels in patients [17]. According to the study, the Visual Anxiety Scale (VAS-A) is deemed an easy-to-use score tool with acceptable reliability and validity. The scale ranges from "no anxiety" on the left to "most anxiety" on the right.

The researcher (first author) was placed in the emergency department of teaching hospitals after obtaining the code of ethics and required permits. Patients referred to Vali-Asr Hospital's emergency department were sampled from Saturday to Monday, while patients referred to Ayatollah Mousavi Hospital's emergency department were sampled from Tuesday to Thursday. The patient's pain and anxiety levels, along with demographic variables, were collected from EMS documents in the ambulance. The PTQ questionnaire was completed through self-reporting after the patients in the emergency department achieved relative stability (Figure 1).

The analysis of the data was conducted using SPSS V. 22 software. The Kolmogorov-Smirnov test was used to assess the normality of the data. The data that was gathered followed a normal distribution. Patients' trust levels were correlated with clinical outcomes using Pearson's correlation coefficient statistical test. Patients' trust was predicted using multiple regression analysis. Additionally, patients' clinical outcomes were predicted using linear regression. A significance level of 0.05 or lower was considered.

Results

The current study included 489 people who met the criteria for participation. A total of 89 individuals were not included in the study as they did not meet the inclusion criteria. The present study had a total of 400 participants.

The majority of participants in this study were male (58.8%), urban residents (67.5%), married (68.8%), high school (32.3%), and insured (95.3%). EMS was most frequently contacted for trauma-related incidents (53.8%). Most of the patients with underlying diseases had not been hospitalized nor used EMS (59.8%). The average level of pain and anxiety was moderate, while the clinical variables were in the normal range (Table 1).

Table 1: Demographic and clinical characteristics of the participants (N=400)

Variable		N (%)
Gender	Female	165 (41.3)
	Male	235 (58.8)
Marital status	Single	125 (31.3)
	Married	275 (68.8)
Education	Illiterate	109 (27.3)
	High school	129 (32.3)
	Diploma	100 (25.0)
	Higher education university	62 (15.5)
Residence	Urban	270 (67.5)
	Rural	130 (32.5)
The reason for contacting Emergency Medical Services	Trauma	215 (53.8)
	Internal diseases	185 (46.3)
Underlying disease	Yes	161 (40.3)
	No	239 (59.8)
History of hospitalization	Yes	126 (31.5)
	No	274 (68.5)
Recent use of Emergency Medical Services	Yes	177 (44.3)
	No	223 (55.8)
Having health insurance	Yes	381 (95.3)
	No	19 (4.8)
Having supplementary health insurance	Yes	58 (14.5)
	No	342 (85.5)
Variable	**Mean**	**SD**
Pain	4.59	2.16
Anxiety	46.48	24.08

SD: Standard Deviation

In this study, most patients reported satisfaction with EMTs, citing speed of performance (87.5%), respect for privacy (98.3%) Grooming in the technician's uniform (89.8%), and Able to speak in the patient's language (99.7%). The patients' trust in EMTs was favorable for both credibility and accessibility, as shown in Table 2.

Table 2: Patients' trust in the emergency medical technicians (N=400)

Patients' trust in	Mean	SD
Credibility	4.09	0.74
Accessibility	3.97	0.81
Total Score Patients' trust in staff	4.09	0.87

SD: Standard Deviation

According to the results of the Pearson correlation coefficient, there is no significant association between the trust patients have in emergency medical technicians and the level of pain they experience (r=0.01, p=0.823). However, there is a significant correlation between patients' anxiety levels and the trust they have in emergency medical technicians. As patients' confidence increases, their anxiety decreases with a negative correlation (r=-0.11, p=0.035).

Multiple linear regression was used to predict patients' trust in staff .The model included demographic factors of the patient, such as age, gender, residence, education, main complaint, recent use of EMS, and prior history of hospitalization. Additionally, staff-related variables, including speed of operation, respect for privacy, ability to communicate with patients, and EMTs grooming, were included as predictor variables in the model. Patients' trust in the EMTs was entered as the dependent variable. The stepwise method was utilized to implement the model. Only four variables can predict patients' trust: EMTs speed, cause of medical emergencies, place of residence, and education. These variables had a moderate correlation (R=0.42) and accounted for 17% of the variance in trust (Adjusted R Square=0.17). These 4 variables predict 17% of the variance of patients' trust in employees (Table 3).

Table 3: Variables predicting patients' trust in the emergency medical technicians using multiple linear regression

Variables	Unstandardized Coefficients		Standardized Coefficients Beta	t	p	95.0% Confidence Interval for B	
	B	Std. Error				Lower Bound	Upper Bound
Speed in performance	-0.89	0.13	-0.34	-6.91	0.001	-1.14	-0.64
Residence	0.19	0.08	0.10	2.12	0.034	0.01	0.36
The reason for contacting EMS	-0.26	0.08	-0.15	-3.00	0.003	-0.43	-0.09
Education	-0.12	0.04	-0.14	-2.67	0.008	-0.21	-0.03

The model included patients' trust in the EMTs as an independent variable to predict anxiety variable. The trust variable (R=0.106, Adjusted R Square=0.009; R=0.163) predicted patients' anxiety (Table 4)

Table 4: Predicting the variables of anxiety and pain based on the patient's trust in the emergency medical technicians

Variable	Unstandardized Coefficients		Standardized Coefficients Beta	t	p	95.0% Confidence Interval for B	
	B	Std. Error				Lower Bound	Upper Bound
Anxiety	-2.93	1.38	-0.11	-2.12	0.035	-5.65	-0.21
Pain	0.03	0.13	0.01	0.22	0.82	-0.22	0.27

Discussion

This study aimed to assess the trust levels of patients in emergency medical technicians and associated factors. The results of the current study showed that patients' trust in EMTs is favorable. Trauma was the primary reason people contacted EMS, and most patients called for the first time.

Consistent with this research, other studies have also found that patients have a high level of trust in healthcare professionals [4,18]. Kim et al.'s study reported a low level of trust in doctors [19]. Additionally, the research conducted by Zhao et al. revealed that few participants expressed trust in the healthcare provider [20].

According to the findings of the study, patient trust could be predicted based on factors including practice speed, reason for contacting EMS, patient residence, and education. The quicker the practice, the greater the trust of patients. Rural patients with limited education and a primary concern for trauma showed greater trust in EMTs. Gopichandran et al. found that patients' trust decreased with increasing age and education [18].

According to Pokhilenko et al., patients' trust decreased as their education level increased [21]. Similar to the studies by Gopichandran et al [18] and Pokhilenko et al [21], higher education was linked to lower patient trust in this study. With increased education, people are more likely to analyze their emergencies and have higher performance expectations for EMTs. The rise in education resulted in a decrease in trust. Improving EMT performance can enhance patient trust, especially among those with higher education. The performance speed of EMTs in our study was connected to patient trust. Professional competencies in Ozaras et al.'s study correlated with higher patient trust, whereas Khammarnia et al.'s study found no significant link between professional expertise and patients' trust level [11, 22].

EMTs' competencies and quickness are highly valued for patients in pre-hospital situations, making them even more important than hospitals. Patients who trust nurses often experience increased relaxation. The nurse's respectful behavior is crucial for enhancing the patient's feeling of safety during vulnerable times [4,23].

The trust variable is related to patient anxiety levels. The study found that when patients trust EMTs, it improves their clinical outcomes. The current study revealed a negative correlation between patients' anxiety and trust. As trust increased, anxiety decreased. Ahmadpour et al.'s study revealed that having a nurse by the patient's bedside enhances satisfaction and recovery, while the nurse's absence leads to increased violence and anxiety [4]. Patients feel safe and their anxiety decreases when they trust healthcare providers' reliability and competence [23].

Conclusion

Patients in the pre-hospital setting often experience pain, anxiety, and uncertainty about their illness. Building trust with EMTs is crucial to improving patient care and alleviating stress. The patients in this study expressed satisfaction with the EMT's performance and had trust in them. According to the study results, EMTs' performance speed, reason for contacting EMS, place of residence, and patients' education level were all factors affecting patients' trust in EMTs. An increase in patients' trust in EMTs led to lower anxiety levels but did not affect their pain.

Further studies should explore the factors influencing patients' trust in pre-hospital staff. In Iran, this study is one of the rare instances where patients' trust in pre-hospitals was evaluated. This study emphasizes the importance of the patient's trust in pre-hospital care and its implications for the health system. The patients' emergency conditions hindered the prompt completion of the PTQ during initial meetings and pre-hospital care due to the impact of their physical and mental states on data accuracy. For data validity, the PTQ was administered in the emergency department after the patient's physical condition became relatively stable. Due to the unique cultural and contextual factors of Iranian society in pre-hospital settings, the generalizability of findings to other societies is limited.

Conflict of interest

The corresponding author of this article is the editor-in-chief of the PCNMJ journal. The review process is conducted like other articles. The final decision regarding this article was made by the executive manager and the editorial board of the journal.

Authors' contributions

Study design: NH, AR R; data gathering: NH, AR R; statistical analysis and interpretation of the data; NH drafting of the manuscript: AR R, NH, MA Y; critical revision of the manuscript: NH, and MA Y.

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