



Analysis of Factors Affecting Satisfaction of 119 Emergency Service Users in Korea

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Abstract

This study attempted to identify the service satisfaction with the 119 emergency service and the factors that affect it based on the responses of subjects who used the service. Data collection was conducted from February 11 to March 11, 2021, using convenience sampling. A total of 1842 subjects who used emergency medical services using 119 ambulance in 2020 participated. For the collected data, frequency, percentage, mean, and standard deviation were calculated, and t-test, analysis of variance, and multiple regression analysis were performed using SPSS 23.0. Based on these results, to further enhance the satisfaction of users of the 119 emergency service and the quality of emergency medical services, it is important to improve the quality of paramedics through education and systems. In addition, to increase user satisfaction, efficient and systematic communication education is required. The quality of emergency medical services will increase only when communication skills required for explanations and promoting understanding are improved.

Index Terms: 119 emergency service, Communication, Emergency medical service, Emergency patient, Satisfaction

I. INTRODUCTION

Today, due to improvements in education and living standards, interest in improving quality of life is increasing. The diversification of highly developed industries and social facilities causes unexpected accidents and increases the number of injuries caused by industrial accidents and accidents at home [1]. In addition, due to changes in living conditions and an increase in life expectancy, the number of circulatory and cerebrovascular diseases is increasing, and the demand for emergency medical services and for the quality improvement of emergency medical services is growing [2, 3]. Moreover, the numbers of acute cardiac disorders, cerebrovascular diseases, and severe trauma that requires urgent response are increasing, and without prompt and appropriate treatment, life may be at risk and permanent functional damage of major organs may occur. Therefore, there is an increasing demand for emergency medical services that can efficiently provide on-site treatment, transport, and hospital treatment [4]. Citizens must also build a

new safety system in the fire department in line with the rise in expectations for the safety system and changes in the structure of consciousness.

An emergency medical service system refers to a system that organizes all the elements necessary to provide quality emergency medical services within a certain area and is generally divided into prehospital and hospital stages [5]. The pre-arrival stage consists of a report, field stage, and transfer stage. In Korea, it is primarily the responsibility of the 119 emergency service team [6, 7]. The emergency medical system is a part of the medical delivery system, but it is also part of the social safety net or welfare service that emphasizes publicity [8]. Accordingly, the establishment of an emergency medical system can provide prompt and efficient medical services from a medical point of view and can mean the expansion of welfare for the safety and health of citizens from a social point of view.

When an emergency occurs due to an unexpected accident or disease, the Korean 119 emergency service team arrives at the

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location as soon as possible, provides immediate patient evaluation and appropriate first aid, and brings the patient to a hospital where they can receive treatment. It is responsible for transport and plays the most important role in maintaining the life of emergency patients [1, 2]. In addition, prehospital first aid has a great influence on the prognosis and life maintenance of emergency patients, and in case of an emergency, it takes up the largest proportion of the report reception stage to the field stage, on-site treatment, and transfer stage. It is the 119 emergency service team that oversees activities such as consultation, first-aid treatment, and transport for these emergency patients [7]. In addition, owing to the increase in the occurrence of various emergencies due to the increase in chronic diseases and the development of industry, the activities and roles of the 119 emergency service team have expanded. Consequently, the number of dispatches is increasing [9]. Korea's 119 emergency service team started in 1982 and has been developing quantitatively and qualitatively in line with the increase in emergency medical demand. However, it has not yet reached the level of emergency services in advanced countries [6]. The original purpose of the 119 emergency services is to maintain a balanced medical system in the health field, to protect people's lives and property from unexpected accidents and various diseases, and to expand and provide preventive health and medical services [10].

One of the criteria for evaluating the emergency medical services of the 119 emergency service team is a method of evaluating the quality of emergency medical services in which a patient who uses the 119 emergency service or the patient's guardian evaluates their satisfaction with the emergency medical service. By analyzing the factors influencing their satisfaction, it is possible to suggest a plan of efforts to address the discomfort and dissatisfaction of patients [7].

In Korea, there have been studies on satisfaction with the service of the 119 emergency service team and factors that affect them, but only some regions and specific population groups have been studied [1, 2, 11]. One problem is that people's awareness of the 119 emergency service team is insufficient, and substantial qualitative growth is not achieved. Therefore, in this study, the satisfaction level with the emergency service was examined using a satisfaction survey of the subjects who used the 119 emergency service team, and factors affecting the satisfaction with the 119 emergency service team were analyzed. Based on this, basic data were presented and implemented to find ways to improve policies related to emergency medical services of the Republic of Korea 119 emergency service team in the future.

II. SUBJECTS AND METHODS

A. Research Subjects and Data Collection

The subjects of this study were selected from those who used the 119 ambulances from the fire department in 2020. A total of 1,900 people were selected using convenience sampling from February 11 to March 11, 2021. Among them, 1,842 people were used as the study subjects, excluding 58 people who were judged to have a uniform response or insincere data or who omitted parts of the survey. During the collection of research data, the subjects were first

informed about the purpose of the study and the points to be considered when completing the questionnaire. Then, they were asked to write down their feelings when using the 119 emergency service.

B. Investigation Variables

The general characteristics of the subjects were gender and age; ages were classified into 20 years old or younger, 21-40 years old, 41-60 years old, 61-80 years old, and 81 years old or older. The characteristics of the use of the 119 emergency service were as follows: the reason for using the 119 emergency service, the number of times it was used, the time required to arrive after the report (subjective), the change in the patient's condition if the 119 emergency service was not used, and the important tasks of the 119 emergency service. The reasons for using the 119 emergency service were classified as injuries, acute or chronic disease, and others. The number of times of use was 1, 2, 3, 4 or more, and the time required to arrive at 119 after reporting was less than 5 min, 5-10 min, 10-20 min, 20-30 min, and over 30 min. If the emergency service was not used, the changes in the patient's condition were classified as follows: results similar to the present one, slightly worse, severely worse, and death. The important tasks of the 119 emergency service were categorized as transfer, on-site treatment, consultation, and others. Satisfaction with the 119 emergency service consisted of 12 items, and the items were on a 5-point (1-5) Likert scale, with "Very dissatisfied" 1 point, "Dissatisfied" 2 points, "Normal" 3 points, "Satisfied" 4 points, and "Very satisfied" 5 points. In this way, out of a total of 60 points, the higher the score, the more satisfied the respondent with the 119 emergency service.

C. Data Analysis

For the analysis of the collected data, SPSS software (version 23.0) was used. General characteristics, 119 emergency service team usage characteristics, and 119 emergency service satisfaction were presented using frequency and percentage, mean, and standard deviation. To compare the satisfaction with the 119 emergency services according to general and usage characteristics, a t-test and analysis of variance were performed. To determine the factors affecting the satisfaction with 119 emergency services, multiple regression analysis was performed on the items that were significant in the simple analysis. The significance level for statistical tests was $\alpha=0.05$.

III. RESULTS

A. General Characteristics and Characteristics of 119 Emergency Service Use

The general characteristics of the study subjects were 59.1% male and 40.9% female, and in terms of age, 3.3% were under 20 years old, 21.6% were 21-40 years old, 42.4% were 41-60 years old, 16.0% were 61-80 years old, 16.6% were >81 years old (Table 1).

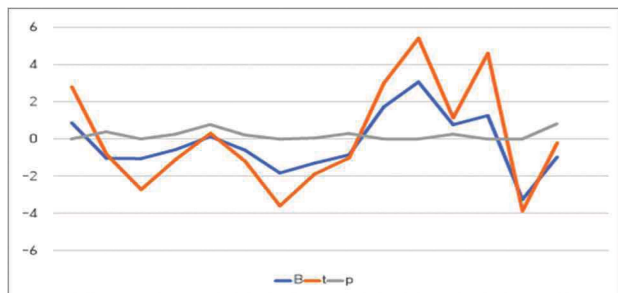


Fig. 1. Service satisfaction according to general characteristics and characteristics of 119 emergency service

Table 1. General characteristics

	Gender	N	%
	Male	1089	59.1
	Female	753	40.9
Age	≤20	61	3.3
	21-40	398	21.6
	41-60	783	42.5
	61-80	295	16.0
	>81	305	16.6

Regarding the characteristics of the subjects' use of the 119 emergency services, 73.4% used them for acute and chronic diseases, 25.2% for injuries, and 1.4% for others, and the frequency of use was 68.3% once, 16.2% twice, 8.4% three times, and 7.1% more than 4 times. The arrival time of the 119 emergency service team after reporting was found to be as follows: the highest at 47.8% in 5-10 min, 31.5% in 10-20 min, 9.4% in 5 min, 7.2% in

Table 2. Characteristics of 119 emergency service use

		N	%
Reason for using 119 emergency service team	Injuries	465	25.2
	acute and chronic diseases	1,352	73.4
	Others	25	1.4
Frequency of use	1	1,259	68.3
	2	298	16.2
	3	154	8.4
	≥4	131	7.1
	>5	173	9.4
Arrival time of the 119 emergency service team after reporting	5≤10	881	47.8
	10≤20	581	31.5
	20≤30	133	7.2
	≥30	74	4.0
Change in patient's condition if 119 was not used	Similar results	116	6.3
	Slight deterioration	591	32.1
	Serious deterioration of condition	973	52.8
	Decease	162	8.8
Important tasks of the 119 emergency service team	Transfer	734	39.8
	On-site treatment	1,054	57.2
	Consultation	52	2.8
	Other	2	0.1

20-30 min, and 4.0% in over 30 min. In the question of “Change in patient's condition if 119 was not used,” the results were as follows: would have deteriorated to a serious condition 52.8%, would have worsened slightly 32.1%, would have died 8.8%, and would have had similar results 6.3%. The important tasks of the 119 emergency service team were on-site treatment (57.2%), transfer (39.8%), consultation (2.8%), and other (0.1%) (Table 2).

B. 119 Emergency Service Satisfaction

Satisfaction with 119 emergency service was 55.12±5.92 out of a total of 60 points, and the average of the questions was 4.59±0.49. Overall, the item “I am satisfied with the 119 emergency service” had the highest score (Table 3).

C. Service Satisfaction According to General Characteristics and Characteristics of 119 Emergency Service

A comparison of the average of service satisfaction according to the general characteristics of the subjects and the characteristics of the 119 emergency service users was performed. The satisfaction scores based on reasons for using the 119 emergency service were 55.31±5.81 points for acute and chronic diseases, 54.68±6.15 points for injuries, and 52.92±6.82 points for others, and there was a significant difference (F=3.72, p=0.024). The scores based on the number of times of use were 55.94±5.08 points for 4 or more times, 55.26±5.77 points for 1 time, 54.94±5.85 points for 3 times, and 54.28±6.82 points for 2 times, and there was a significant difference (F=3.12, p=0.025). Based on the time required to arrival of 119 ambulance after reporting, the satisfaction was 56.20±5.23

Table 3. 119 emergency service satisfaction

	M±SD
The 119 report was received promptly	4.55±0.61
The staff who received the 119 call were friendly	4.57±0.61
The person receiving the 119 report gave a professional answer (explanation) to the requested information	4.49±0.68
The 119 caller explained the necessary first aid before the ambulance arrived	4.49±0.72
Given the distance to the accident site, the 119 emergency service team arrived at the site quickly	4.59±0.64
When dealing with patients or reporters, the 119 emergency service team was kind and engaged in first-aid activities	4.63±0.59
As part of first-aid measures, the 119 emergency service team tried to find out in detail the patient's condition, such as blood pressure and temperature measurement	4.63±0.59
The 119 emergency service team kindly explained the necessary first-aid activities and first-aid measures to the patient or the reporter	4.61±0.59
The 119 emergency service team provided sufficient hospital information (available for treatment) to the patient or reporter	4.60±0.64
The ambulance that was dispatched had first-aid kits for first aid	4.61±0.57
The interior of the ambulance was overall clean and tidy	4.64±0.55
Overall, I am satisfied with the 119 emergency service	4.66±0.57
Average	4.59±0.49
Total	55.12±5.92

Table 4. Service satisfaction according to general characteristics and characteristics of 119 emergency service

		M±SD	t or F	p
Gender	Male	55.32±5.86	1.67	0.094
	Female	54.84±6.00		
Age	≤20	54.31±5.82	2.15	0.072
	21-40	54.83±6.01		
	41-60	54.91±6.12		
	61-80	55.58±5.40		
	>81	55.78±5.74		
Reasons for using the 119 emergency service	Injuries	54.68±6.15	3.72	0.024
	acute and chronic diseases	55.31±5.81		
	Others	52.92±6.82		
Number of times of use	1	55.26±5.77	3.12	0.025
	2	54.28±6.82		
	3	54.94±5.85		
	≥4	55.94±5.08		
	>5	56.20±5.23		
After reporting, the time required to arrive by 119 ambulance	5-<10	55.47±5.66	5.20	<0.001
	10-<20	54.28±6.07		
	20-<30	55.03±7.24		
	≥30	55.28±6.05		
Changes in the patient's condition when an ambulance is not used	Similar results	52.74±7.19	16.42	<0.001
	Slight condition	54.67±6.05		
	Serious condition	55.91±5.47		
	Death	53.75±6.23		
Important tasks of the 119 emergency service	Transfer	54.42±6.38	15.51	<0.001
	On-site treatment	55.80±5.41		
	Consultation	51.34±6.52		
	Others	54.50±7.77		

points for less than 5 min, 55.47±5.66 points for 5-10 min, 55.28±6.05 points for more than 30 min, 55.03±7.24 points for 20-30 min, and 54.28±6.07 points for 10-20 min, and there was a significant difference (F=5.20, p<0.001). If an ambulance was not used, the satisfaction scores based on the change in the patient's condition were as follows: would have worsened to a serious condition 55.91±5.47 points, would have worsened to a slight condition 54.67±6.05 points, would have died 53.75±6.23 points, and similar results 52.74± 7.19 points, and there was a significant difference (F=16.24, p<0.001). Based on the important tasks of the 119 emergency service, the satisfaction scores were 55.80±5.41 points for on-site treatment, 54.50±7.77 points for others, 54.42±6.38 points for transfer, and 51.34±6.52 points for consultation, and there was a significant difference (F=15.51, p=0.001). Gender and age, which are general characteristics, were not significantly related to the 119 emergency service satisfaction (Table 4).

D. Factors Affecting 119 Emergency Service Satisfaction

To determine the factors affecting the satisfaction with the 119

Table 5. Service satisfaction according to general characteristics and characteristics of 119 emergency service

		B	t	p
Use of 119 emergency service(/injuries)	Acute and chronic disease	0.882	2.771	0.006
	Other diseases	-1.015	-0.852	0.394
Number of uses (/1)	2	-1.035	-2.733	0.006
	3	-0.551	-1.114	0.265
	≥4	0.151	0.281	0.779
	5-<10	-0.586	-1.223	0.221
Arrival time (>5 min)	10-<20	-1.806	-3.609	<0.001
	20-<30	-1.281	-1.907	0.057
	≥30	-0.832	-1.036	0.300
If you did not use the 119 emergency service (/same result)	Slight deterioration	1.742	2.972	0.006
	Serious deterioration	3.079	5.391	<0.001
	Death	0.787	1.114	0.265
Important duties of the 119 emergency service(/transportation)	On-site treatment	1.279	4.575	<0.001
	Consultation	-3.227	-3.883	<0.001
	Others	-0.951	-0.232	0.817
R ² =0.071, F=9.235, p<0.001				

emergency service, multiple regression analysis was performed on the significant items in the simple analysis (Table 5). As a factor influencing the satisfaction of the 119 emergency service, the reason for use was significantly higher in the case of acute or chronic disease than in the case of injuries (β=0.882, p=0.006). The frequency of use was significantly lower in the case of two times than in the case of one time (β=-1.035, p=0.006). The time required for the arrival of 119 ambulance after reporting was significantly lower in the case of less than 10 to 20 min than in the case of less than 5 min (β=-1.806, p<0.001). If the 119 emergency service was not used, the satisfaction in the cases of the change in the patient's condition will be slightly deteriorated (β=1.742, p=0.006) and will worsen significantly (β=3.079, p<0.001) was significantly higher than that in similar conditions. Regarding the important tasks, the satisfaction with the 119 emergency services was significantly higher in the case of on-site treatment (β=1.279, p<0.001) than in the case of transfer and significantly lower in the case of counseling (β=-3.227, p<0.001). The explanatory power (R²) was 7.1% (F=9.235, p<0.001).

IV. DISCUSSION AND CONCLUSIONS

A. Discussion

Emergencies can occur anytime, anywhere, and anyone can be in that situation. For emergency patients, prompt and high-quality emergency medical services are essential and very important [12]. In this study, satisfaction with the 119 ambulance services was 55.12±5.92 out of a total of 60 points, and the average Likert scale of each question was 4.59±0.49, indicating high satisfaction. As immediate and urgent patients use the emergency room by using the 119 emergency service, the satisfaction of using the emergency room is high [13]. Moreover, the 119 emergency services are con-

sidered to be evaluated highly. The item "Satisfied with the 119 emergency service," which had the highest score among the items, was rated at 4.66 ± 0.57 points. Communication is a means of establishing a therapeutic relationship and is essential for successful and high-quality therapeutic work because it influences the behavior of others [14]. In addition, communication among healthcare workers increases patient trust and satisfaction with treatment in their medical practices [15]. As such, it can be said that the results of the 119 paramedics explaining the patient's condition and treatment to the patient or guardian and providing appropriate first-aid treatment were the result of trust and positive perception. However, inappropriate communication may cause conflict with the patient and increase patient anxiety, which may negatively affect treatment or prognosis [16]. Factors affecting satisfaction with the 119 emergency service are as follows: the reasons for using the 119 emergency service and the number of times it was used, the time required to arrive 119 ambulance after reporting, the change in the patient's condition when the 119 emergency service was not used, and the important tasks of the 119 emergency service. Patients with acute or chronic diseases showed higher satisfaction with 119 emergency services than those with injuries, which was contrary to the results of previous studies [14]. The reason for this is that the number of cardiovascular diseases has increased due to the rapid aging in Korea, and the use of the 119 emergency services has increased more than the number of injured patients. In addition, in the results of this study, 32.6% of patients over 61 years of age and 73.4% of patients with acute and chronic diseases accounted for a large proportion of elderly patients. In terms of the number of times the patient used 119 emergency service, patients who used it once showed high satisfaction. These results indicate that patients who have used the 119 emergency service twice or more can compare the emergency medical responses with each other, but since there is no comparison target for patients who used it for the first time, their overall satisfaction with the 119 emergency service was high. Satisfaction was high when the time required for arrival of the 119 ambulance after reporting was less than 5 min and when "the patient's condition would have deteriorated slightly or seriously" if the 119 emergency service was not used. These results can be seen as the result of an urgent situation judgment of an emergency [6, 11], and it is thought that this is because the 119 emergency service team arrived at the site as quickly as possible and started providing emergency medical services on site. The role of the 119 emergency service within the emergency medical system has been greatly developed in response to the various emergency medical service needs of citizens who use the ambulance, but there is a need to improve the service by studying the satisfaction with the first-aid service provided. Recently, urbanization and population concentration have rapidly progressed due to industrial and economic development, and disasters and accidents related to risks are increasing along with an increase in income level. At this point, it can be said that it is meaningful to systematically examine the activities of the 119 paramedics, check the satisfaction of citizens with their activities, and suggest future development directions. Among the satisfaction responses of the subjects, the satisfaction with on-site emergency treatment and consultation was higher than that with transportation. This result is judged to be the result of the improvement in the quality of the 119 paramedics, and the evaluation, treatment, and counseling of the patient gives confi-

dence to patients. In 2005, among 5,134 paramedics of the 119 paramedics, first-class emergency medical technicians accounted for only 957 persons (18.6%), but in 2018, this proportion increased to 42.9% to 4,675 out of 10,882 people [5]. First-class emergency medical technicians are professionals who evaluate and treat patients at the prehospital stage. It can be assumed that the increase in the number of first-class emergency medical technicians among the 119 paramedics would have improved the quality of the prehospital emergency medical services of the 119 emergency service. Since the 119 emergency service determines the survival rate and prognosis of patients with appropriate treatment in the prehospital stage of the emergency medical system, treatment and transfer are achieved through smooth communication, and the patient can reduce the economic burden on the guardian [17]. Attitudes such as reactions, explanations, interests, and responses that are directly related to emergency patients determine the quality of emergency medical services, and the higher the quality of emergency medical services, the higher the satisfaction of patients using the 119 ambulance [18]. In addition, emergency medical services, which are closely related to life and health, are basic requirements for people and are essential to guarantee their quality of life. To improve the factors affecting satisfaction, it is necessary to increase the credibility of people, and to ensure that the skills of paramedics and high-quality emergency medical services can be provided to those who use the ambulance for the first time. To this end, it is necessary to secure the effectiveness of education by strengthening education and training and establishing an evaluation system so that practical education and training for paramedics can be conducted. In addition, effective and systematic communication education is essential for the 119 paramedics, and communication skills that can be explained and understood by users should be improved. The limitations of this study are that it was not conducted with all subjects using the 119 emergency service, and it is a cross-sectional investigation that cannot be generalized to the subjects at the time of the investigation. Nevertheless, it is meaningful to identify the factors that affect the service satisfaction with the 119 emergency service and suggest the future direction of the development of the 119 emergency service. Moreover, it is thought that it can be used to guide policy measures to improve emergency medical services.

B. Conclusion

This study attempted to identify the user satisfaction with 119 emergency services and to identify factors affecting the satisfaction of patients and their guardians who used the 119 emergency services. As a result of the study, the average score of the satisfaction with the 119 emergency service was 4.59 ± 0.49 , which is high. The factors affecting the satisfaction with the 119 emergency services were as follows: the reason and frequency of use of 119 emergency services, time required for arrival of the 119 ambulance after reporting, change in the patient status if 119 emergency services were not used, and the importance of 119 emergency service tasks. Based on these results, to further increase the satisfaction of the users with the 119 emergency service and the quality of the service, it will be important to improve the quality of the paramedics through education and systems. In addition, it will be necessary to

increase the satisfaction of users with emergency medical services by improving the quality of services by hiring appropriate personnel and professional workforce.

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