RESEARCH ARTICLE

THE EFFECT OF TRAFFIC FACTORS AND TECHNOLOGY FACTORS ON CHRONOLOGICAL DELAY OF EMERGENCY (115) ON THE BESIDES OF INJURED PEOPLE IN BOYER AHMAD CITY IN 2017

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Abstract

Objective: The aim of this study is to investigate traffic factors and technology factors on chronological delay of emergency (115) on the besides of injured people in Boyer Ahmad city in 2017. The research method of this investigation from the point of view related to target is operational and according to nature is descriptive-analytic.

Methods: The target population is users of 115 emergency services of Boyer Ahmad city from the first of March to August 2017. On the basis of the similar statistics of the first six months of 2016, 2240 people have used emergency services of Boyer Ahmad city that on the basis of Krejcie and Morgan table, 100 people will be chosen as statistical sample. In this study, data has been gathered by using researcher made questionnaire. At first, needed data has been achieved by responses to questionnaires and then study variables have been tested and analyzed by using SPSS statistical software and statistical methods in two sections of descriptive and perceptive.

Results: The results of the study indicated that there is a meaningful relation between environmental, relational and traffic factors and also between technological factors and 115 emergency delay on the patient's beside in Boyer Ahmad city (_p_>0.05).

Conclusion: In conclusion as, the meaningfulness level and correlation coefficient between studied variables with 115 emergency delay respectively are: traffic factors (_p_=0.001, r=0.73), technology factors (_p_=0.001, r=0.62). So, research hypothesis is verified.

Keywords: Chronological delay, emergency (115), traffic factors.

INTRODUCTION

Medical emergency service is responsible for performing prehospital cares that acts in direct relation with the department of hospital emergency. The main goal of emergency system (115) is fast and exact performing of proper medical acts instead of trying to reach the exact recognition, because first medical acts always have priority in emergency patient (115)[1]. The speed of presenting services in emergency center (115) toward decreasing mortality has special importance. If the time period of workflow in emergency unit is high, it represents disorder in total policies, executive instructions, current processes and ways of emergency (115)[2]. Bandy can be one of the minatory items of patient immunity in emergency levels that existence of reduction in these levels can be the starter of the following problems for the patient. In order to increase the quality of curing patient process in emergency department, we should focus on all stages of relation including transferring patient from emergency medical services to the personnel of emergency unit[3]. Most of done investigations about related factors to emergency chronological delay (115) have not properly explained potential problems and relational obstacles that are limited to emergency unit. According to current conditions and so important and key role of brandy process of patient from medical emergency team to emergency unit of hospital, it seems that inspecting viewpoint of the main personnel involved in this process, namely personnel of emergency and emergency unit of the hospital in order to exact discussion of related factors on emergency chronological delay (115) during the process and

finding the reasons and factors involved in this process is important[4].

Statement of the problem
Along retaining health of people, several organizations have been based that each of them performs this important item by accepting some parts of this responsibility and according to the roles that seconds and minuets play in rescuing humans, the center of accident management and medical emergency has been shaped that plays important and fundamental role in retaining health of people[5]. The speed of accuracy and accordance in presenting medical services of emergency, substantial relations among components of the team, proper and scientific management, total acts are items that must be informed by all medical teams[4].
If an accident occurs and in the first 2-8 minutes the patient is looked after, the patient can be rescued 40% from definite death[6]. Medical emergency annually leads to mortality, corporal and psychic disability related to thousands of people and lots of financial injures in the country, also after each accident, psychic stresses and high financial pressures are entered to near people to the patients and injured people that are sometimes irrecoverable[7]. Finding risky patients as soon as possible and performing necessary medical acts for them are goals of triage in accident area[8]. Presenting medical emergency can be effective on reduction of mortality and disability before prevention in injured people and reviving their lives (Dehghan, 2012). In our country, performing prehospital cares and transferring patient to the hospital are related to headship information center of 115 emergency operations and technicians of this center are obliged to be present in the bed of patient with sufficient facilities as far as possible during 4 minutes after enouncement of accident news. Ideal standard for the time of dispatching ambulance and reaching to the area is 5 minutes. In this regard, studies in the country including the investigation of Rakei as investigating average spent time in patients with head trauma in the time of accident until transferring to Mobasher Kashani hospital[4] and the study of Zohoor and Pilevar Zadeh as investigating the speed of servicing in emergency section of Kerman hospital and a research as thousands items of head trauma to Khatamol Anbia emergency of Zahedan by Rezayi[7] and foreign performed investigation including a study that has been done by Tanigawa and Tanaka as systems of medical emergency services in Japan: past, present and future and investigating the risk of factors in in-city traffic accidents by Javis and Corn Javis and Corn have been done[8]. The performed investigation verifies that a comprehensive study about average spent time for departure of 115 emergency personnel to the bedsides of patients(including injured people related to events and accidents and other patients) has not been done, so by performing this investigation, the investigator wants to study average time for reaching for transferring patients and injured people by personnel of 115 emergency of Boyer Ahmad city and hopes that their results cause amendment of the quality related to presenting services, more exact planning for decreasing the time and increasing the speed of aid services.

Speed, accuracy and accordance in presenting the services of emergency medical aid personnel for decreasing mortality and disability have special importance. Investigating the time of reaching to accident area by 115 emergency of Boyer Ahmad city in 2017 is the goal of the present study[5].

The importance and necessity of performing the study
Kohgiloye and Boyer Ahmad province has 40 115 emergency bases that Boyer Ahmad city has 4 urban bases and 9 road bases. As the time of reaching 115 ambulance on the bedside of injured people and patients is really important, so by performing this study, practical suggestions related to doing that can be reposed to responsible people to has an important role in decreasing the time of reaching ambulance on the bedside of injured people and patients by exact planning. It is also important in increasing the quality of emergency services related to Kohgiloye and Boyer Ahmad province and increasing satisfaction of people about this organization. Totally, according to the results of done studies, it can be predicted that the condition of preparedness and the speed of emergency ambulances related to Yasooj city are not accordance with country and global standards, so in this investigation we want to study this topic in Boyer Ahmad city[8].

Conceptual and operational definitions of variables
Conceptual definition of preparedness
Preparedness means activities and proceedings that beforehand are done for assurance of effective reply to the effects of hazards and includes issuance of on-time and effective early alarm and preparation of the plan related to preparedness of education and practice and if necessary, temporary offloading of people and assets from risky region.

Operational definition of preparedness
Series of preventive proceedings include doing maneuver and practice of simulation related to critical conditions and creating accordance for effective opposition before occurring of the accident.

Conceptual definition of emergency
Emergency is called a place that emergency medical services to the patients are presented there. Commonly, emergencies are regarded as a unit or department of the hospital, but typically for better and faster access of patients are placed in situations separate from the main building. One of the most important parts of an emergency is resuscitation room along with all its necessary facilities. About 4 decades are passing from the definition of emergency medicine as one of the medical professions and nowadays is presented as one of the index and defined majors in the plans of residency[9].

Operational definition of emergency
In this study, the intention is 115 ambulances that are obligated to looking after medical emergency items and presenting services to injured people and emergency patients. Actually, the action of this collection starts from accident area and concludes in medical center.

Medical emergency
Medical emergency system or emergency medical services is worldwide divided into two main classes

according to structure and types of function: In German-Franco system, facilities and equipment are carried on the patient's bedside and the doctor is used in ambulances. Actually, ambulance is a unit of presenting intensive care that the doctor presents necessary proceedings on the patient's bedside. Anglo-American system or common system is in the countries of England and America that emergency system of Iran in the start of initiation was related to this class. In this system, technicians of emergency medical aid are presented in the area in various levels of basic, mean and advanced(according to need), examine the patient or injured person and do early and urgent proceedings and then transfer them to medical center. Indeed, in this system the doctor is also presented, but do not go on patient's bedside and is in contact with technicians by telephone and wireless and guides them. Criterion of choosing type of emergency system in every country depends on economic, cultural, natural, historical, religious, infrastructural and medical conditions.

Experimental history

Moradian *et al.,* in an investigation has proceeded to studying the time of reply to emergency items and the reasons of delay in missions related to 115 emergency center in Shiraz[10]. Findings of the study indicated that in all times of day and night, 49.9% of missions have been performed in 8-10 seconds, means that more than standard time and the reasons of replying emergency missions more than standard time include destruction of the road, high traffic of the path, bad weather, long distance, dispatching from other bases because of lacking sufficient ambulance in the base of related region, receiving wrong address by operator, lack of sending ambulance, delay on dispatching ambulance and at the start of mission by technician that this index in emergency center of Shiraz has been existed because of dispatching from lacking sufficient ambulance in the base of related region, high traffic of the path and long distance. Reducing the time of replying in 115 emergency missions needs the attention of health ministry, cure and medical emergency of the country about this action to dedicate more budget to this unit and also the possibility of exact need assessment of amounts of ambulance, needed equipment and emergency base according to population density and people's requests in each urban region be performed.

Malek shahi *et al.,* in the study has proceeded to investigating obstacles and effective facilitating factors on presenting standard cares of injured people (triage) from the point of view related to nurses of Shohadaye Ashayer educational hospital[11]. The results of the study indicated that obstacles and different facilitating factors in hospital (equipment, personnel, and communications) are effective on the process of triage. According to this issue that emergency section of each hospital is regarded as the nearest part for entering clients and the first place of his/her contact to medical centers. So, in these conditions, the possibility of rescuing related to the life of patient is more, when the emergency medical unit possesses medical facilities and equipment and standard nursing services. So, it is suggested that managers of nursing services distinguish effective obstacles on triage and in order to eliminating above mentioned obstacles, perform necessary proceedings for presenting on-time services, reducing mortality, disabilities and costs, optimum usage of equipment and facilities. Also, in this regard, for improving awareness level of nurses with in-service educations and improvement of human power continuous and practically have more attention to keep patient's life and prevent costs loss. Ghiasian and colleagues in an investigation have proceeded to investigating effective factors on delay related to referring to the hospital after occurring acute stroke[8]. The results of the study indicated that the factors such as high distance from medical center, lacking sufficient awareness about stroke signs, occurring stroke at night, lacking direct reference to the professional center, living alone and lacking evidence at the time of stroke are possible factors of delay after occurring stroke to medical centers. Jafakesh Moghaddam in a research, has proceeded to investigating the speed of servicing in the section of emergency related to incident hospitals of medical services University in North Khorasan province in 2011[12]. The results of his study indicated that most of the studied indexes had proper servicing speed, but the time for preparing the results of quantitative experiments differs from international and country standards. According to the importance of indexed in deciding for releasing patient, it is suggested to adopt plans at the level of management and hospital to reduce time intervals related to presenting services to the least time.

METHODS

Method of the present study according to the goal is practical and according to the nature is descriptive-analytic. This study has been done sectional with goals. Target population is users of 115 emergency services of Boyer Ahmad city from the first of March to August 2017. The first actions are referring to unit headship of the operations related to accident management center and medical emergency in Yasooj and in-unit accordance of medical sciences University of Yasooj and management center of accidents and medical emergency in Boyer Ahmad city and checking papers of reporting mission (PCR) in 2017 and comparing of 10% of these mission papers with the office of center operator after verifying the accuracy of reports[13]. The device of collecting data in field stage is observation card and investigating the form of monthly completed collecting data of management center and emergency medical aid of the country. Deleted missions are missions that have been abolished because of unreal contacts. Done missions include urban and road performed missions that collecting data has been performed from the bases of 115 emergencies. The amount of done missions was divided on the basis of trauma mechanism (accident and non-accident) in Boyer Ahmad city. In this dividing, it has proceeded to investigating mean time of reaching first responders on the bedside and studying the least and most time of performing mission. Data was analyzed by SPSS21 analytic software of the format related to absolute and comparative frequency indexes[14].

Table 1: Frequency distribution and variable percentage of studied sample age.

Frequency percentage	Frequency	Age Range
0.15	19	20-25
0.30	27	26-30
0.35	32	31-35
0.20	22	More than 35
0.100	100	Sum

The device of study and collecting data

In this study, data has been collected by using researcher made questionnaire.

Methods and device in analyzing data

According to the early research related to some of the existing records in 115 emergency of Boyer Ahmad city, average time of reaching to the bed of patient was regarded as 15±8 minutes that maximum accuracy of two minutes and 130 missions are needed for estimating the average of time. The main device in collecting data is the server of computer center of emergency in Boyer Ahmad city that all information related to missions and related times to them and also features, phone numbers and the addresses of each user of 115 emergency are existed on it. All information can be sent to EXCEL and SPSS software that analyses and computations will be done by mentioned software.
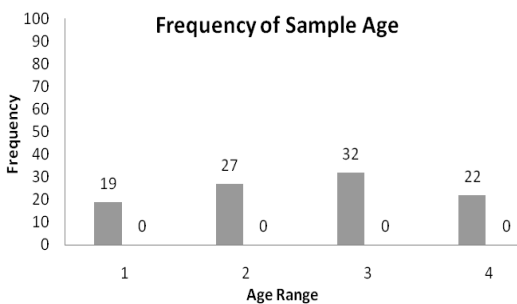

Figure 1: Frequency of sample age.

At first, needed data has been achieved by replied answers to questionnaires and then research variables have been examined and analyzed and by using SPSS statistical software, statistical ways will be used in two sections of descriptive and perceptive. In this study, according to the research hypotheses, descriptive statistics (frequency tables, frequency percentage) and perceptive statistics (Separate t-test, Pearson correlation) will be used[15].

Describing indexes of demographics

The results of descriptive statistics according to the age represent that from all statistical sample, the ages were 19 people (0.15%) 20-25 years old, 27 people (0.68%) 26-30 years, 32 people (0.61%) 31-35 years and 22 people (0.20%) more than 35. On the basis of achieved information about level of education related to responders, 20 people (0.10%) have had associate, 42 people (0.48%) have had bachelor and 38 people (0.42%) have had master degrees (Table 2). As it can be seen in Table 3, the mean and standard deviation in the variable of environmental factors respectively are 3.98 and 0.5725, in the variable of relational factors are 3.95 and 0.67038, in the variable of traffic factors are

4.11 and 0.85407 and in the variable of technology factors are 4.19 and 0.74811.

Table 2: Frequency distribution and variable percentage of the education related to studied sample.

Frequency percentage	Frequency	Education
0.10	20	Associate
0.48	42	Bachelor
0.42	38	Master
0.100	200	Sum

In the above Table 4 (The table of regression slope) according to achieved meaningfulness level in Table 4, table of homogeneity related to regression slope it can be said, it is assumed that homogeneity slope of regression does not support normality of distribution related to variables scores. So, the possibility of using parametric tests is allowed in most of the variables.

Table 3: Mean and Standard deviation of the points related to testable items in research variables.

Number	Standard deviation	Mean	Satirical Indicators Variable
	0.572	3.98	Environmental factors
100	0.6703	3.95	Communicational factors
	0.8540	4.1	Traffic factors
	0.7481	4.19	Technology factors

The main hypothesis

There is a meaningful relation between traffic factors and technology factors with chronological delay of emergency (115) on the bedsides of injured people in Boyer Ahmad city in 2017. In order to explain effective structures on chronological delay of emergency (115), multiple regression analysis by synchronic method (Enter) has been used. Table 4 represents related information to this analysis. As it can be observed in 4-7 Table, effective factors on chronological delay of emergency(115) which consist of: 1) traffic factors(X3) 4-technology factors(X4) respectively entered regression model. The variable depended on research, is chronological delay of emergency (115).

Table 4: The table of homogeneity related to regression slope for normal distribution of research components.

Variable name	Sum of squares	df	Mean	F	sig
Environmental factors	3.74	1	3.74	9.62	0.004
Relational factors	5.62	1	5.62	1.457	0.001
Traffic factors	49.31	1	49.31	3.85	0.06
Technology factors	19.6	1	19.6	1.2	0.24

The amount of computed F in 99% level (sig=0.001, F=72.442) represents the meaningfulness of regression. Also, the results of Table 5 indicate that prediction variables of 78.2% (Adjust R^2=0.782) predict the

amounts of criterion variable (chronological delay of 115 emergency). One the one hand, investigating coefficients of standardized regression (Beta) indicate that the variable of direct supervision has had more role and effect on in predicting depended variable 6.

Table 5: The results of multiple regression analysis.

P	t	Beta	B	Variable
0.001	3.448	-	0.493	Constant number
0.09	1.713	0.204	0.179	Traffic factors
0.06	2.455	0.280	0.265	Technology factors

F= 72.44; Sig=0.001; R= 0.884, R²= 0.771; R² Adjust= 0.782

As it can be seen in Table 6, there is a meaningful and positive relation between studied factors with 115 emergency delays. As, the meaningfulness level and correlation coefficient among studied variables with 115 emergency delay respectively are: traffic factors (p=0.001, r=0.73), technology factors (p=0.001, r=0.62). So, each hypothesis is verified. In other words, by increasing each of these variables, 115 emergency delay is also increased. According to 0.001 meaningfulness level, HO hypothesis is verified and HO hypothesis is refused. So, it can be concluded that there is a meaningful relation among studied variables with 115 emergency delays.

Table 6: The coefficients of simple correlation among studied variables with 115 emergency delay.

Number of samples (n=100)	Significance (p)level	Correlation coefficient (r)	Statistical indicator/ Predicting variable
100	0.001	0.73	Traffic factors
	0.001	0.62	Technology factors

According to β=0.62 effect coefficient and t-coefficient=12.23 critical value (-1.96>t>1.96) it has been reported that in Table 7 that is higher than 1.96, predictive variable of traffic factors can effect on the variable of 115 emergency delay and explain it. Therefore, by 0.95 reliance, this hypothesis is verified and the contrary of the claim is rejected.

Table 7: The table related to the effect of traffic factors on 115 emergency delay variable.

Direct way	Effect coefficient (β)	Meaningfulness value(t-value)	Result
Traffic factors	0.62	12.23	Verifying hypothesis

According to β effect coefficient and t coefficient=15.47 critical value ((-1.96>t>1.96) it has been reported that in Table 8 that is higher than 1.96, predictive variable of technology factors can effect on the variable of 115 emergency delay and explain it. Therefore, by 0.95 reliance, this hypothesis is verified and the contrary of the claim is rejected.

According to the results of regression by phased method which can be observed in Table 9, 52.3% of changes related to 115 emergency delay are related to environmental factors and 31.7% related to relational factors, 52.3% related to traffic factors and 38.1% related to technology factors. So, all the studied variables have meaningful relation with 115 emergency delay (p>0.05).

Table 8: The table related to the effect of technology factors on 115 emergency delay variable.

Direct way	Effect coefficient (β)	Meaningfulness value(t-value)	Result
Technology factors	0.71	14.38	Verifying hypothesis

RESULTS AND DISCUSSION

According to the results of regression by phased method 52.3% of the changes related to 115 emergency delays on the patient's bedside are related to 52.3% traffic factors and 38.1% technology factors. So, all the studied variables have meaningful relations with 115 emergency delay on the bed of patient (p>0.05). As it can be observed in chapter four, there is a positive and meaningful relation between studied factors with 115 emergency delay on patient's bedside, as the level of meaningfulness and correlation coefficient between studied variables with 115 emergency delay on the bed of patient are respectively traffic factors (p=0.001, r=0.73), technology factors (p=0.001, r=0.62). So, each hypothesis is verified. In other words, by increasing the usage of each variable, 115 emergency delays on the patient's bedside is increased.

In our country, performing prehospital cares and transferring patient to the hospital are under the care of headship information center of 115 emergency operations and technicians of this center as far as possible during 4 minutes after announcing accident news have to be present with sufficient facilities on patient's bedside. Ideal standard for the time of dispatching ambulance and reaching to the area is 5 minutes. The speed of presenting services in emergency (115) center in order to decrease mortality has special importance. If the time of workflow related to patients in emergency section be high, it indicates disorder in general policies, executive instructions, processes and current processes of emergency (115). Kohgiloye and Boyer Ahmad province has 40 bases of 115 emergency that Boyer Ahmad city has 4 urban bases and 9 road bases[11]. As the time of reaching 115 ambulance on the bed of injured people and patients has special importance in one way that it deals with the life of human, so by doing this investigation, practical suggestions due to performing that can be controlled by responsible people to have important role in reducing the time of reaching ambulance to the bedsides of injured people and patients by exact planning. This issue will be effective on increasing the quality of emergency services in Kohgiloye and Boyer Ahmad province and will have an important role in increasing satisfaction of people in this organization. The duty of

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emergency medical services is the investigation of medical emergency items and presentation of services to injured people and emergency patients. The structure of this system in each city includes a command room and some aid units. Command room of medical emergency has the role of headship related to the health of accidents in the area of city and headship unit of province operations has the role of supervision related to city commands. The speed of presenting services in emergency for reducing mortality has special importance. If the time period of workflow in emergency unit is high, it represents disorder in total policies, executive instructions, current processes and procedures in the hospital. The main functions related to admission emergency department are stabilizing condition and presenting medical services to the patients that personally or by different ways refer to this section in various conditions and emergency and non-emergency conditions.

Table 9: The results of analyzing regression on research variables with 115 emergency delay.

Regression factors			F Proportion and its possibility	Determination factor RS	Predicting variable
Significance level	t	Beta rate (B)			
$p<0.5$	13	0.724	F=157- $p<0.001$	0.523	Traffic factors
$p<0.5$	9	0.918	F=88 - $p< 0.001$	0.381	Technology factors

Table 10: Multiple regression coefficients (synchronic effect) of both variables on 115 emergency delay on the patient's bedside.

Regression factors (β)				Possibility F Factor P	Determination factor RS	Multiple correlation MR	Statistical indicator Variable predictor
4	3	2	1				
	0.387= β 8= t p=0.001	0.412= -β 10= t p=0.001	0.399=β 8= t p=0.001	153=F p=0.001	0.766	0.761	Traffic factors
β=0.204 4= t p=0.001	0.402= β 8= t p=0.001	0.298= -β 6= t p=0.001	0.363=β 7= t p=0.001	133=F p=0.001	0.792	0.786	Technology factors

The main goal of emergency system is fast and exact performing of proper medical proceedings instead of attempt to reach exact diagnosis, because early proceedings always have priority in emergency patient and if the patient in early moments and the first entering to the hospital is not properly investigated and cured, maybe the existence of really advanced super specialty also in the following hours and days cannot be effective on helping the patient.

Limitations

- Lack of investigating all effective factors on emergency delay.
- Time limitation according to academic calendar of the university.
- Limited amount of done researches in the country and abroad.
- Limited measuring devices of questionnaire.
- Limitedness of statistical population to 115 emergencies in Boyer Ahmad city.
- Executive limitation and impatience of personnel toward replying because of longtime test and high amounts of items related to this investigation.
- By lack of possibility related to the results according to limited sample and population for emergencies of other cities, access to research sample had problems related to responsible people of the emergency and hospital.
- Availability of book and articles about main factors effective on 115 emergency delays was not existed.

CONCLUSIONS

According to this issue that most of transferred people to the hospitals consist of ill patients and the system of emergency medical services (115) is the first group that encounters these patients and has the vital duty of early cure and care, more suitable educational and quality control for emergency technicians should be regarded and better equipment and ambulances should be prepared for medical emergency centers. Also, increasing the amount of 115 emergency bases can have more effective role in decreasing the time of reaching the ambulance to the patient's bedside. By presenting modern and advanced devices and technologies and placing them in 115 emergency cars and early works and emergencies such as taking fracture's radiography and ECG of the patient in the area by emergency medical services personnel before reaching to hospital, we can place the patient in better medical and health condition.

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AUTHOR'S CONTRIBUTION

Sadat SE: writing original draft, methodology, investigation. **Barzabad PA:** formal analysis, data curation, conceptualization. **Asl IM:** writing, review

and editing. The final manuscript was read and approved by all authors.

DATA AVAILABILITY

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

CONFLICT OF INTEREST

No conflict of interest is associated with this work.

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