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Challenges of Emergency Medical Services utilization by the older adults in Tabriz, Iran

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Abstract

Background: As the number of older adults is increasing, the health care services such as Emergency Medical Services (EMS) should be promoted. One of the preconditions for the use of health services is awareness of these services and their terms of use. This study is conducted to evaluate the awareness of the older adults in Tabriz about EMS and the terms of services.

Methods: This cross-sectional survey was conducted in a representative sample of over 60 years old noninstitutionalized population in Tabriz (Iran). It included 1062 participants (514 males and 548 females) who were selected using Probability Proportional to Size (PPS) sampling method. Service awareness is considered as being informed about the existence of the EMS. Knowledge about EMS is defined as knowing the EMS phone number and knowledge about its free and 24-hour service. After completing the informed consent, data collection was conducted in the households of the participants. Data analysis was conducted using logistic regression.

Results: The findings showed that 47% of the older adults were not familiar with the EMS system. Awareness of EMS in males (63.4%) was higher than females (44.2%) and also it was higher among those born in cities (61.2%) than rural areas (46.1%). Holding primary, secondary, and higher education compared with illiteracy had higher chance of awareness of EMS by more than 2, 4, and 12 times respectively (OR= 2.53, OR= 4.69, and OR= 12.09).

Conclusion: Due to high rate of illiteracy and low public awareness, older adults do not have appropriate knowledge about the facilities, conditions, and terms of using EMS and may not be able to demand some of their essential services; therefore, notifying and increasing awareness about the available services to older adults are necessary.

Keywords: *Awareness; Emergency Department; Geriatric Medicine; Health services; Effectiveness*

Introduction

Iran will experience rapid population changes in the coming decades (1-3). Population aging has major consequences for the health system (4). Emergency invasive diagnoses are more prevalent for the older patients (5). The condition of the aged people is usually more acute and is accompanied by co-morbidities(6). Emergency Medical Services (EMS) plays a crucial role in timely provision of health care, especially life threatening conditions such as trauma, Acute Coronary Syndromes, stroke, and loss of consciousness. In comparison to the other ways, EMS provides the fastest means of transportation to the Emergency Department (ED) and the best chance to get treatment early (7).

Although societies have prepared community-based health and support services to support the older adults, the provided services are underutilized and one of the obstacles to their use is the lack of awareness of such services (8). Awareness and use of services were highly correlated (9). Definitions of service awareness in the first meaning is knowing that the intended services are existent. But in fact, service awareness—or lack of it—is more complex than knowing that the intended services exist. Awareness is defined as being conscious of having knowledge of, or being informed about it (10). The distinction between knowledge and awareness of services is suggested by Krout (1983). While awareness is a general understanding that a service exists, knowledge includes “knowledge of what the program is or does, where it is located, or how one gets involved with it”(11).

Krout's study have shown that the utilization rate of existing services is very low among older adults (11). The study on Canadians aging 65 and over demonstrated that awareness towards health agencies affected the pattern of use more than other factors (12). The possibility of older adults' unawareness of the recommended services for their age group or unawareness of being free or insurance coverage of services are some reasons that older adults fail to get regular clinical preventive services (13). Awareness is a general understanding that a service exists and unawareness of service availability is considered a reason for nonuse (8). The main purpose of the community support services is to help people retain social functioning and quality of life; however, lack of awareness of these services is troubling (14).

According to the previous studies, the rate of using emergency services by the aged patients is high (15-19), and more resources are needed (16, 19, 20). Pre-hospital providers are involved in older patients' transportation as they usually need to receive assistance for transportation to the ED (21). Thirty-eight percent of EMS transports in the US was dedicated to the people aging 65 and more from 1997 to 2000, although the proportion of old population transported

to the hospitals by EMS is estimated to exceed half of the transportations in the following decades (22, 23).

Existing evidence indicates that only a small proportion of aged patients presenting to EDs are dispatched to use EMS in Tabriz (24). The aim of the present study was to examine the older adults' awareness and knowledge about EMS and its terms of use and the associated factors in Tabriz.

Methods

Study setting: East Azerbaijan Province is located in northwest of Iran. Tabriz, the capital city of the province, is the largest economic hub, and the most populated city in north-west of Iran. According to the general population and housing census, the population aged 60 years and above in 2015 was about 174000 (more than 11% of the city's population) in Tabriz (25).

Study population: The current study is a cross-sectional survey and its statistical population included all ≥ 60 years old community-dwelling older adults in Tabriz city.

Sample size and sampling method: In this study 1,062 participants were selected using Probability Proportional to Size (PPS) sampling method. This method is a sampling procedure, in which the probability of a unit being selected is proportional to the size of the ultimate unit, giving larger clusters or blocks a greater probability of being selected.

As a first step, in order to ensure that all units in the population have the same probability of selection irrespective of the size of their cluster, 107 out of 8531 urban blocks were selected randomly as following: Sampling interval was calculated dividing the total population by the number of selected blocks. The first block was selected using random number table. Then the consecutive blocks were determined utilizing randomized systematic sampling process.

The next step was the random selection of 10 participants from each selected block. So, the total sample size was 1070, which 8 of them were excluded due to impaired cognition which was evaluated by Mini-Mental State Examination (MMSE). Finally, data collection was carried out in 1062 community-dwelling older adults (514 males and 548 females).

Measures:

In line of the objective of the study, awareness and knowledge about the EMS has been examined among older adults. Service awareness -or lack of it- is considered as being informed about the existence of the EMS. Knowledge about EMS is defined as knowing the EMS phone

number and knowledge about its free and 24-hour service. In addition, they were asked about the ability of calling the EMS and the history of requesting service.

Data collection and data analysis:

The tool for data collection was a self-developed questionnaire consisting of two sections: the sociodemographic section and the other section that was relevant to the objective of study. The following items have been used to assess awareness and knowledge about EMS: Awareness of the existence of EMS, Knowing the EMS phone number, Knowing about the free and 24-hour service of EMS. In addition, they were asked about the ability of calling the EMS and the history of requesting service. The questionnaire was completed by trained interviewers. Descriptive data have been presented as frequency (and percentages) for categorical variables. In order to assess the association of two categorical variables, Chi-square test was applied. multiple Logistic regression was used to predict factors that influence the awareness of EMS. Statistical analyses were done using IBM SPSS-20 (Chicago, IL, USA). A p-value of <0.05 has been considered as statistically significant.

Results

The average age of the population was 70.19 years old. In terms of marital status, the highest proportion (71%) was related to married participants and the lowest proportion (0.7%) was related to those who had never married. More than 54% of the older adults were illiterate (unable to read or write). In terms of the family type, almost 58% were living in extended families and then nuclear families and living alone were in the second and third places in order. According to the findings, in the case of needing medical emergency, the older adults were using different patterns to refer to the ED. The most popular way to reach medical services was referring with descendants (46.3%). The next common way was taxi (18%). Using EMS was in the third place with 17%, and the remaining used other ways. Interestingly, 32 people (3 percent) announced that they did not refer to any hospital in any case.

The relationship between EMS awareness and demographic variables was examined using Chi-square test. As shown in Table 1, the relationship between awareness and all of the variables including: gender, age, marital status, education, place of birth, kind of family, and household size was significant ($p < 0.001$).

About the familiarity with EMS, some significant findings were found. Only 572 (53%) of the older adults were aware of EMS and a considerable number of them were not aware of the terms of use and way of contact. Although using EMS among aware population was significantly higher than uninformed (79.5% vs. 20.5%; $P < 0.001$); less than one-third of aware people had the history of calling EMS.

As shown in Table 2, among the population who were aware of EMS, almost 38% were not aware of EMS phone number, 38% were not aware of the provided free services, and more than 28% could not use telephone independently to call EMS and request a service. The satisfaction rate with the arrival time and behavior of EMS personnel in population who had received service were 149 (85%) and 147 (84%), respectively.

Multiple logistic regression models were used to examine the association between some characteristics and the awareness of EMS. The adjusted model included age, gender, education, marital status, place of birth, kind of family, and household size. Findings showed that awareness of EMS among educated older adults was much higher than illiterates (65.7%, 81.7%, and 91.2% vs. 36.5%). The logistic regression models demonstrated that higher education increased awareness of EMS. As represented in Table 3, the primary, secondary, and higher education respectively increased the chance of awareness of EMS by more than two, four, and twelve times than illiteracy (OR= 2.53, OR= 4.69, and OR= 12.09).

Discussion

There are few studies on the awareness of the older adults about health system services and according to the literature review there are no studies on the older adults' awareness of EMS in Iran. Therefore, the comparison of findings of the present research with other studies was only limited to a few works.

Our study showed a high prevalence of unawareness about EMS, terms of EMS use, EMS phone number, and free services among the Iranian older adults, especially in females.

The findings of this study on low awareness of services were in agreement with the findings by others. Previous studies have shown that awareness about existing services is much lower than thought (8, 26). Being aware of EMS services is important, as lack of awareness may lead access failure (8, 26, 27). One of the most frequent reasons for not using available services is the caregiver's unawareness of the services (8).

Findings showed that a small proportion of patients were dispatched to ED by EMS. Similar to the other studies, these results confirmed that EMS has been used by informed older adults more than those who were uninformed (8, 9). As demonstrated in previous literature, there was a high correlation between awareness and use of services (9) and most often being uninformed about existing services was an obstacle for utilization (8).

Contrary to this study that showed lack of awareness among women was more than men, some previous studies have indicated that male caregivers were more likely to be unaware of the available services (8, 9, 14, 27, 28). However, Snider (1980) reported no significant difference between gender and awareness of the health services (12). The high prevalence of unawareness of EMS among aged women compared with men, lies in the differences in their education. In addition to the high rate of illiteracy among Iranian older adults, there is a significant gender inequality in Iran's illiteracy rate among them. The illiteracy rate among older women is more than older men (73.1% vs. 40.7%) (25). Nowadays; thanks to the improvement of social conditions, in spite of inequality during a long period of time in the past, the literacy rate of women under 30 years is more than their male peers (25).

According to the findings of present study, literacy level had the greatest impact on awareness about EMS, terms of EMS use, and EMS phone number. Strain and Blandford (2002) reported similar results as the caregivers with less education are more likely to be unaware of the availability of services (8). According to the results of National Population and Housing Census in 2016, literacy rate for the population aging 60 and more was less than 50 percent in Iran(29). Educational attainment is linked to many aspects of a person's well-being and illiteracy is a crucial issue in the demographic characteristics of the older adults. It seems that high illiteracy rate among Iranian older adults can be an explanation for high prevalence of unawareness about EMS and its availability. This population might not be able to seek some of their essential services due to unawareness.

High rate of illiteracy and the increasing number of the older adults living in nuclear families far from their children could increase the importance of aged people empowerment. In this regard, preparing educational packages for the older adults with local dialects along with the participation of authorities as well as broadcasting educational programs through provincial broadcasting centers is recommended.

Conclusion

As specified, one of the obstacles to services use is the lack of awareness of such services. Therefore, notifying and increasing awareness about the present services to the older adults are necessary for the effectiveness of health services.

This study showed that, to increase the effectiveness of EMS programs and services, special attention should be paid to all aspects of processes, even obvious and seemingly settled issues. To improve the awareness of the EMS system, public guidance, training programs, community based education as well as social media support, are needed to be utilized to improve the aged community's knowledge.

List of abbreviations

EMS: Emergency Medical Services

PPS: Probability Proportional to Size

ED: Emergency Department

MMSE: Mini-Mental State Examination

Declarations

Ethical approval and consent to participate

This study was reviewed and approved by deputy of research ethics committee of Tabriz University of Medical Science (TBZMED.REC.1394.1183). Informed consent was obtained from all participants and they were assured about confidentiality of personal information.

Consent for publication

Not applicable.

Availability of data and materials

Data gathered for the study is available from the corresponding author.

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Authors' contributions

RRG Conceptualised the study, supported analysis, wrote the manuscript. MHS Conceptualised the study, reviewed the manuscript. AM Analysed the data, reviewed the manuscript. ZP Conceptualised the study, reviewed and edited the manuscript. MY Reviewed and edited the manuscript. AA-Z Conceptualised the study, supported analysis, wrote the manuscript, project administration. The authors read and approved the final manuscript.

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Conflict of Interest: The authors declare that there are no conflicts of interests.

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Table 1. Awareness of EMS existence & Demographic variables of older people

Characteristics	Awareness of EMS existence			p-value*
	Aware n (%)	Unaware n (%)	Total n (%)	
Gender				
Male	326(63.4)	188(36.6)	514(48.0)	P<0.001
Female	246(44.2)	311(55.8)	548(52.0)	
Age				
60-64	223(66.2)	114(33.8)	337(31.1)	P<0.001
65-69	117(57.4)	87(42.6)	204(0.19)	

70-74	88(44.4)	110(55.6)	198(0.18)	
75-79	84(51.9)	78(48.1)	162(0.15)	
80-84	39(35.8)	70(64.3)	109(0.10)	
85-89	15(35.7)	27(64.3)	42(0.04)	
>=90	6(35.7)	13(64.3)	19(0.02)	
Marital Status				
Never Married	4(57.1)	3(42.9)	7(0.01)	P<0.001
A Married	468(60.9)	301(39.1)	769(0.72)	
Divorced	3(20.0)	12(80.0)	15(0.01)	
Widow/Widower	97(34.6)	183(65.4)	280(0.26)	
Education				
Illiterate	213(36.5)	370(63.5)	583(0.55)	P<0.001
Primary	190(65.7)	99(34.3)	289(0.27)	
Secondary	107(81.7)	24(18.3)	131(0.12)	
Higher education	62(91.2)	6(8.8)	68(0.06)	
Place of birth				
Village	255(46.1)	298(53.9)	553(0.52)	P<0.001
Town	317(61.2)	201(38.8)	518(0.48)	
Kind of Family				
Extended	341(55.0)	279(45.0)	620(0.58)	P<0.001
Nuclear	186(57.0)	136(42.2)	322(0.30)	
Loneliness	43(35.2)	79(64.8)	122(0.11)	
Other	29(28.6)	5(71.4)	7(0.01)	
Household Size				
1	44(36.1)	78(63.9)	122(0.12)	P<0.001
2	183(51.7)	171(48.3)	354(0.33)	
3-5	307(61.9)	189(38.1)	496(0.46)	
>=6	38(38.4)	61(61.6)	99(0.09)	

EMS: Emergency Medical Services
* Chi square test

Table 2: distribution of EMS knowledge & history of use

	Yes n (%)	No n (%)	Total n (%)
Knowing the EMS phone number	356(62.2)	216(37.8)	572(100)
Known about Free of EMS	360(62.9)	212(37.9)	572(100)
Ability of dialing EMS	410(71.7)	162(28.3)	572(100)
History of contact with EMS	175(30.6)	397(69.4)	572(100)

EMS: Emergency Medical Services

Table 3: Logistic regression analysis of the relationship between awareness of EMS and risk variables in older adults

Variables	Awareness		OR	CI 95 %	P-value
	Aware	Unaware			
Gender					
<i>Male</i>	326	188	1.00		
<i>Female</i>	246	311	0.75	0.54-1.03	0.08
Age					
<i>60-64</i>	223	114	1.00		
<i>65-69</i>	117	87	0.64	0.43-0.95	0.030
<i>70-74</i>	88	110	0.44	0.29-0.66	<0.001
<i>75-79</i>	84	78	0.73	0.47-1.13	0.163
<i>80-84</i>	39	70	0.48	0.28-0.81	0.006
<i>85-89</i>	15	27	0.42	0.19-0.89	0.023
<i>>=90</i>	6	13	0.46	0.15-1.37	0.165
Marital Status					
<i>Never Married</i>	4	3	1.00		
<i>A Married</i>	468	301	0.64	0.12-3.21	0.591
<i>Divorced</i>	3	12	0.12	0.01-1.08	0.060
<i>Widow/Widower</i>	97	183	0.42	0.08-2.08	0.291
Education					
<i>Illiterate</i>	213	370	1.00		
<i>Primary</i>	190	99	2.53	1.81-3.52	<0.001
<i>Secondary</i>	107	24	4.69	2.79-7.91	<0.001
<i>Higher education</i>	62	6	12.09	4.88-29.94	<0.001
Place of birth					
<i>Village</i>	255	298	1.00		
<i>Town</i>	317	201	1.21	0.90-1.62	0.196
Kind of Family					
<i>Extended</i>	341	279	1.00		
<i>Nuclear</i>	186	136	1.18	0.72-1.92	0.502
<i>Loneliness</i>	43	79	1.10	0.38-3.18	0.850
<i>Other</i>	2	5	0.63	0.10-3.99	0.628
Number of Family					
	44	78	1.00		
<i>1</i>	183	171	0.94	0.30-2.90	0.923
<i>2</i>	307	189	1.38	0.48-3.99	0.543

3-5 >=6	38	61	0.75	0.23-2.37	0.628
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EMS: Emergency Medical Services

OR: Odds ratio

CI: Confidence Interval

The OR represents each unit increase in the variable.
