Evaluating the Effectiveness of a First Aid Training Course on Drivers

Şoförlere Verilen İlk Yardım Eğitiminin Etkinliğinin Değerlendirilmesi

(Araştırma)

Sağlık Bilimleri Fakültesi Hemşirelik Dergisi (2009) 47–58

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ABSTRACT

Introduction: Natural disasters such as earthquake and erosion, war and accidents have been causing disabilities and death of so many people as well as leaving people homeless. First aid training has an important place in preparation of the community to the emergency situation.

Methods: The research was performed to assess the effectiveness of first aid training program for service drivers. Drivers were trained based on a first aid book which was prepared by the researchers, and they were shown how to practice if they need. Data were collected by using pre-test questionnaire, post-test questionnaire and observation form. The collected data were evaluated by percentage, repeated measurements of oneway ANOVA, paired-samples T test, pearson correlation coefficient, and fisher's exact chi-square test.

Results: As a result of this research it was determined that the level of knowledge of service drivers on first aid was increased in posttest. After first aid education, the majority of the drivers received perfect point or near to perfect point in the evaluation of their first aid practices.

Conclusion: Based on these results, wide-spreading of the first aid education programs to whole sections of the community with collaboration of the various associations and foundation and constant and practical of this program and nurses that are taking an effective role in first aid training were suggested.

Key Words: *First aid, education, community education*

ÖZET

Giriş: Deprem, ve toprak kayması gibi doğal afetler, savaşlar ve kazalar çok sayıda insanın sakatlanmasına, ölmesine, evsiz kalmasına ve büyük ekonomik kayıplara yol açmaktadır. Acil durumlara hazırlıkta toplumun ilkyardım konusunda eğitimi büyük önem taşımaktadır.

Metod: Bu araştırma şoförlere yapılan ilkyardım eğitiminin etkinliğini değerlendirmek amacıyla yapılmıştır. Şoförler araştırmacılar tarafından hazırlanan ilkyardım eğitim kitapçığı eşliğinde eğitilmiştir. Veriler ön test, son test, soru kağıdı ve gözlem formu ile toplanmıştır. Elde edilen veriler yüzdelik sayılar, iki eş arasındaki farkın önemlilik testi, tekrarlı ölçümlerde tek yönlü ANOVA, pearson korelasyon katsayısı ve fisher kesin ki-kare testi ile değerlendirilmiştir.

Bulgular: Araştırmadan elde edilen sonuçlara göre, ilkyardıma ilişkin sorulara doğru yanıt veren şoför oranının son testte artış gösterdiği saptanmıştır. Eğitim sonucunda şoförlerin ilkyardım uygulamalarına ilişkin çoğunlukla tam yada tama yakın puan aldıkları belirlenmiştir.

Sonuçlar: Bu sonuçlar doğrultusunda, ilkyardım eğitim programlarının çeşitli kurum ve kuruluşların işbirliği ile toplumun tüm kesimlerine yaygınlaştırılması, sürekli ve uygulamalı olması, hemşirelerin ilkyardım eğitiminde etkin rol almaları önerilmiştir.

Anahtar Kelimeler: *İlkyardım, eğitim, toplum eğitimi*

Introduction

Human being has been facing with emergency cases during the history. Natural disasters such as earthquake, flood, and land slide have caused disabilities and deaths of people, left them homeless, and also caused big economic loses. These cases are still very important problems for human being, actually never ends, although there are sophisticated developments in science and technology[1-4].

WHO estimates that 250 million work accidents occur every year and 330 thousands work accidents cause deaths[4]. In Turkey, 1.296 people died and 2.249 people become incapacity to work permanently as a result of work accidents[5]. The study carried out in the US determined 30.9 death rates per 100.000 injuries. Same study showed that traffic accidents had a share of 9.6 among the deaths because of these injuries[6]. Traffic accidents have also big share among the major death causes in Turkey for years, and about 4.781 persons were killed in traffic accidents in the year 2000 according to Turkey State Institute of Statistics[7].

The community as well as state and state institutions must be ready against emergency cases[4].Only those communities, which are ready against emergency cases, can practice effective life saving and first aid applications. For this reason the capacity of community on first aid issue can not be underestimated. It is obvious that training is the most important way to get the community is ready against emergency cases. Health promotion is the dominant approach in improving health status of the communities in recent years, and this respect nurses have important responsibilities to provide necessary information by the purpose of making people responsible to protect and

improve their health status individually[8]. First aid has a special and important place among the necessary information and applications to be provided to the community.

The studies related to the first aid showed that consciously and timely first aid applications lowered mortality ratios significantly. 15-18 percent of deaths as a result of injuries can be prevented by consciously applied first aid practices[5]. For instance, it was reported that giving the patient right position could lower mortality rate as much as 10%[4]. In addition to life saving results of first aid, effective and timely first aid practices also prevent the disabilities[5]. For these reasons whole community should be trained in a way that everybody can practice first aid[9-13.]

The study done by Breivik et al[14] provided different training materials enabling people to learn first aid individually. Then they examined whether individual first aid learning method was effective, and they concluded that the method was effective. The study of Bayraktar and Celik[15] discusses that big majority of the drivers did not receive first aid training, and transporting and first aid were not practiced effectively. The authors showed how serious the problem was by conducting a survey on taxi cab drivers. It is thought that teacher, students, drivers, soldiers, police as well as health care personnel are the special groups that should be trained on first aid. Especially drivers have the priority because they face with accidents very often.

First aid has a special importance in Turkey such a country where earthquake, flood, and traffic accidents occur often and leave so many causalities. Many studies in Turkey on first aid mainly aim at determining the knowledge needs of the community, but the first aid training programs as well as the studies investigating the effectiveness of first aid programs are very limited. The main purpose of this study is to asses the effectiveness of a first aid training program aiming at providing first aid skills and knowledge to service drivers.

Methods

Design

The study was performed as the action research to assess the effectiveness of a first aid training program for service drivers.

Sample

The universe of this study consisted of 4000 service drivers registered to The Business Association of Ankara Public Service Vehicles. The sample of this study consisted of 105 service drivers detected by The Business Association of Ankara Public Service Vehicles between July 2 and August 2, 2001.

Instruments

The preparation of data collecting tools and 'first aid training booklet for drivers';

The tools and booklet were developed by the researchers based on the relevant literature[16-21].

Pre-test questionnaire form; includes the questions on demographic characteristics of and first aid knowledge level of the participants.

Post-test questionnaire form; includes the questions to assess first aid knowledge level after the training program, and views and suggestions of the participants about the training.

Observation form; was prepared to evaluate the skills of the drivers on first aid practices, and includes behavioral steps of the drivers on first aid.

First aid training program booklet; was developed by the researchers, and was provided to all participants. It includes below subtitles; Definition and principles of first aid, Structure and functions of human body, Evaluation of accident place and injured person, Getting out and transporting the injured from the accident place, Providing of breathing and circulation, Medical emergency cases, Poison and bites, Burn, heat and cold exposure, Bleeding control, Shock, Injuring, Fracture, dislocation, and be sprained, Bandage application, Important call numbers be known in case of emergency.

Implementation of training course

The validity of the data collection tools was tested by a prior small research carried on 10 drivers. The necessary adjustments were made in data collection tools in light of the results of this small research. The permission of The Business Association of Ankara Public Service Vehicles was obtained before starting to training course. During the course total 105 service drivers separated in different groups including 15-20 drivers were trained, and training each group took 4 days (total 24 hours).

The major steps of the training course were as following:

Purpose of the training course was explained to the drivers to be trained. Pre-test questionnaire was implemented by the purpose of obtaining socio-demographic characteristics and knowledge level of the drivers on first aid. First aid booklets were given to the participants.

Participants were trained by following the booklet provided previously by the researchers. During the training educational techniques such as lecture, role-playing, question-and-answer, demonstration, and education materials such as overhead, data show were used. The trainers were showed how to apply first aid techniques such as splint, bandage, and slide materials on human manikin. Then, the participants were requested to practice these techniques teached by the trainers. First aid practices of the participants were evaluated by using an observation form. In this form every action of the participants was evaluated as true or false, and then they were graded. During this evaluation, each participant was requested to practice basic CPR. But other practices of first aid were not practiced by every participant. Instead, the participants were requested to choose a practice by chance from the box, and then practice that first aid. At the end of training course a post-test questionnaire was used to evaluate knowledge level of the drivers on first aid, and to get their views and suggestions on the training course.

Ethics

Written approval from The Business Association of Ankara Public Service Vehicles and informed consent and verbal permission from the participants were obtained before the study was initiated.

Limitations

There has one limitation of this study. This study was conducted only of 105 service drives. Therefore, the results can not be generalized to all service drivers.

Data analyses

The independent variables of this research were demographic characteristics of the participants of the training course while dependent variables were means of knowledge level and practice performances of the participants on first aid applications. Different questions were asked, and each true answer was given 1 point to measure the knowledge level of the drivers on first aid in pre and post-test questionnaires. Overall knowledge level was based on total 100 points. To measure the first aid skills of the drivers each first aid application was divided into different steps and each step was given 1 point. Total practice performances of the drivers were calculated by adding each right step practiced by the drivers. This means that maximum performance level depends on the number of the steps in the first aid applications.Data analysis was used percentages, paired-samples T test, Pearson correlation coefficient test, repeated measurements of oneway ANOVA and fisher exact X^2 test. To compare the different scores of pretest and posttest of the participants, paired-samples T test was used as an appropriate statistical technique. To test whether there was a relationship between post-test and mouth to mouth artificial breathing/ cardiac compression mean points of the drivers, pearson correlation coefficient test was used. Fisher Exact X^2 test was another statistical technique used in this study to determine whether there was the relationship between the demographic characteristics of the drivers (education, place of getting driver license, participating to a first aid course, and any accident) and mouth to mouth artificial breathing and cardiac compression. In addition, to test whether there was a relationship between the demographic characteristics of the drivers (education, age, place of getting driver license, participating to a first aid course, and any accident) and the mean points from pre and post, repeated measures of oneway ANOVA was used.

Results

The mean age of the participants of the training course was 41.5 years (SD:10,1) (N:105), and the majority (58.1%) was literate or graduated from just primary school, meaning low level of schooling among the participants. The majority of the drivers (69.1%) stated that they did not attend any first aid course.

The mean knowledge level of the drivers on first aid was calculated as 41.87±13.9 (min:2, max:74) in pre-test, and 69.05 ±14.2 (min:12, max:95) in post-test. The difference between pre and post-test scores was found statistically different ($p<0.05$) (Table 1).

Table 1. Pre- and Post-Test Mean Points of Drivers

	$\overline{X}$	SD	N	*t	SD	P
Pre-Test	41.87	13.9	105	-25.01	104	P< 0.05
Post-Test	69.05	14.2	105			

*: Paired Samples T Test was used.

Table 2 shows mean first aid practice points by different first aid applications. Looking at the results in table 2, it can be said that the training course achieved desired outcomes since first aid practice mean points were very close to maximum points of each application.

Table 2. First Aid Practice Average Points of Drivers for First Aid Interventions

First Aid Interventions	***n**	$\overline{X}$	**SD**	**Max**	**Min**	****Total point**
Artificial breathing mouth to mouth and cardiac compression	104	18.84	2.6	21	0	21
Skills of transportation Getting the victim out of vehicle	9	3	0.0	3	0	3
External bleeding control (pressure-point control)	7	6.4	1.5	7	3	7
Coma position	19	14	0.0	14	14	14
First aid for sprain	6	4.8	0.4	5	4	5
Evaluating the victim from head to toe	6	19	1.8	21	17	21
Bandage Application Bandage to finger Bandage to elbow Bandage to knee	 5 6 2	 4.8 3.8 4	 0.4 0.4 0.0	 5 4 4	 4 3 4	 5 4 4
First aid for shock	10	9.8	1.7	11	7	11
Tourniquet bandage in special cases	11	8.1	1.8	9	4	9
Triangular bandage application Hand triangular bandage Shoulder triangular bandage Head triangular bandage	 3 7 3	 4 2 3	 0.0 0.0 0.0	 4 2 3	 4 2 3	 4 2 3

*: Number of drivers practicing first aid interventions

**: The maximum point calculated by giving one point to every right practice of steps in that first aid application

Table 3 shows the steps for mouth to mouth artificial breathing and cardiac compression, and the practice skills of the drivers. It can be seen that the majority of the drivers practiced the steps correctly.

Table 3. The Distribution of Drivers Practicing Artificial Breathing and Cardiac Compression Steps Appropriately or Inappropriately For Adults

Steps	Appropriate No.	%	Inappropriate No.	%	*Total No.	%
Hold the person from shoulders and ask 'are you all right?'	95	90.5	9	8.6	104	100
Seek help from others	70	66.7	34	32.4	104	100
Place the victim on his/her back on a furm surface	100	95.2	4	3.8	104	100
Bring earnings 3-4 cm close to victim's mouth and nose	81	77.1	23	21.9	104	100
Place three middle fingertips from neck's front to near to middle line	80	76.2	24	22.5	104	100
Move fingertips through from neck's middle line to neck's side	51	48.6	53	50.5	104	100
Check neck pulse	97	92.4	7	6.7	104	100
Be sure that heart is not functioning	97	92.4	7	6.7	104	100
Get foreign bodies out of mouth	88	83.8	16	15.2	104	100
Close nose using the had which is on his forehead to keep his neck extended	103	98.1	1	1.9	104	100
Up the chin and close nose	103	98.1	1	1.9	104	100
Put your mouth around the victim's mouth	103	98.1	1	1.9	104	100
Blow air (two times)	103	98.1	1	1.9	104	100
Remove your mouth from his mouth to allow the air in his lung to come out of the air way	102	97.1	2	1.9	104	100
Monitor chest	101	96.2	3	2.9	104	100
Take to position himself at one side of the victim's shoulder	100	95.2	4	3.8	104	100
Note sternal landmarks by marking off two finger breaths above the xyphoid process. Place the heel of the hand nearst the person's head alongside the index finger on the lower half of the victim's sternum	99	94.3	5	4.8	104	100
Place the heel of the other hand on the back of the first hand	101	96.2	3	2.9	104	100
Fingers may be interlaced and not push the chest	103	98.1	1	1.9	104	100
Compress the sternum 3.5-5 cm (fifteen times)	104	100	-	-	104	100
To prevent position migration, do not remove your hands between compression	104	100	-	-	104	100

*: One participant did not attend to practice exam

There is a close relationship between first aid knowledge and artificial breathing and cardiac compression practices. Table 4 shows significant evidence in discussing that increasing knowledge level of the drivers on first aid increases the probability of practicing life saving first aid applications correctly because the correlation coefficient between post-test mean point and artificial breathing/cardiac compression practice points of the drivers was statistically significant ($p< 0.05$, r: 0.336) (Table 4). This result means that increasing the knowledge level of the drivers on first aid increases the ability of first aid applications.

Table 4. Post-Test and Mouth to Mouth Artificial Breathing/ Cardiac Compression Mean Points of The Drivers

	$\overline{X}$	SD	N	*r	P
Post-Test	69.05	14.2	105	0.336	P< 0.05
Artificial Breathing/ Cardiac compression	18.84	2.6	105		

*: Pearson Correlation Coefficient

Discussion

Everybody in the community may face with emergency cases that need first aid applications. The person who is supposed to save the life and to practice first aid application is the person who is the nearest to the victim of emergency case. It is thought that training all the community including teachers, students, and drivers as well as health care professionals on first aid is very beneficial.

This study determined that the knowledge level of the drivers was increased significantly after the training (Table 1).This result shows the training course for the drivers was effective. This study is the only one example of the studies in the literature showing the effectiveness of first aid training courses given to different segments of the population in different countries[22-26]. The study of Yakubovich[23] showed that the mothers participating the health education course including first aid applications had higher knowledge level on first aid compared to the mothers who did not participate to this course. It was also determined that those adolescent participating the first aid training course had more knowledge than those who did not participate[26]. All these findings make us think that spreading first aid training courses to all the community benefits very much.

Although not given in a separate table the relationship between the demographic characteristics of the drivers (education, age, place of getting driver license, participating to a first aid course, and any accident) and the mean points from pre and post-test was found statistically insignificant ($p>0.05$). But the difference between pre and post-test means was statistically significant in time ($p<0.05$). The significant difference between pre and post test means and insignificant differences according to drivers' demographic characteristics suggest that the training program achieved its predetermined purposes effectively. Putting in other words our first aid training course was effective.

All drivers participating the training course got the maximum points for transporting the victim, giving the right coma position, knee and foot bandage, press to main vessel, and triangular bandage practices after the course (Table 2). The high rate of success in our training program can be attributable to using manikin and other real first aid materials and equipment (first aid bag, bandage material, slides, etc.). Another factor increasing the success of our program might be the fact that all drivers participating to the course practiced the all first aid applications teached during the course. In related literature there are studies showing that first aid training programs giving special importance to the practice were more effective[25,27,28] .For instance, in the study of Eisenburger and Safar[25] two different groups including high school students were given a first aid program, but manikin was used for educational purposes during the program for the only one group. The results showed that the group practicing first aid applications on manikin had higher performance than the other group had. Capone et al.[28] stated that fabric workers trained via television on first aid were not good at practicing artificial breathing and cardiac compression, and they suggested manikin for effective first aid training programs.

At the end of the training course the majority of the drivers practiced artificial breathing mouth to mouth and cardiac compression appropriately, and this is a desired outcome of the training course because these activities are very essential for life saving. The study of Wik et al.[29] showed that the discharge rate among the patients mouth to mouth whom artificial breathing and cardiac compression were applied appropriately to was higher compared to the discharge rate among the patients who inappropriate artificial breathing and cardiac compression were applied.

Table 3 shows that all of the drivers did well and correctly the activities of "compressing the sternum 3.5- 5 cm" and "to prevent position migration, do not remember your hands between compression" as a part of artificial breathing and cardiac compression. The drivers did mistakes mostly in controlling pulse (the success rate was 50.5%). Similarly, the study of Woo (2000) discussed that the more common mistake in artificial breathing and cardiac compression occurred in controlling pulse[30.]

It was determined that the higher first aid knowledge points the more appropriate mouth to mouth artificial breathing and cardiac compression practices. This result recommends that increasing first aid knowledge level increases the probability of practicing first aid applications more appropriately (Table 4).

Although not given in a separate table, the relationship between the demographic characteristics of the drivers (education, place of getting driver license, participating to a first aid course, and any accident) and mouth to mouth artificial breathing and cardiac compression was found statistically insignificant ($p>0.05$). However, it was found that 80.0 percent of drivers aged 23-32 years old, 85.2 percent of drivers aged 33-42 years old and 73. 1 percent of drivers aged 43-48 years old, and 51.9 percent of drivers aged 49-70 years old got higher points than sample average, and the differences among the age groups were statistically significant ($p<0.05$). Similarly, Berkebile et al.[31] found that age might be an important factor. They gave a training course on artificial breathing mouth to mouth and cardiac compression to a group of students, and at the end of the study they discussed that the success rate among the relatively younger students was higher compared to older students[31,32]. These results

can be explained by the fact that relatively younger individuals are more talented in understanding and remembering.

In addition, 99 percent of drivers stated that they benefited from training course and they would recommend the course to other drivers. The most important reason of recommending the course to other drivers by participant drivers (46.6 percent) was the willingness to practice effective first aid. 41.7 percent of drivers stated that this kind of first aid training courses would benefit to not only drivers but also all of the community segments.

The more important two recommendations coming from participants for the future first aid training courses were "repeating the course each year" and "widening the course outline". The same recommendations were raised by drivers participated to other training courses in other countries, too[30,33,34]. For instance, Sefrin and Schafer[33] found that the majority of the knowledge gained at the end of first aid training course was unforgotten by the participants, and they were suggested continues first aid education. Eisenburger and Safar[25] stated that first aid education should be given under primary education, and continues education was very important.

Conclusions

It can be discussed that drivers lack of knowledge on first aid, the training course increased first aid skill and knowledge level of the drivers and the method of practical education was effective. The method that we followed during the training course was to give special emphasis to practice by participants. Because lecturing is not sufficient alone to improve psychomotor skills[27,35,36]. Lecturing or reading may distract and result in information overload. Acquisition of psychomotor skills depends mainly on practice and repetition[37,38]. The majority of knowledge is forgotten because either people never need these or people need these rarely. If the knowledge gained is practiced or repeated systematically, it will be learned and remembered very effectively. For these reasons, the drivers participating to first aid course should practice the first aid applications and attend to future first aid courses periodically. In addition, it can be suggested that first aid training programs should be evaluated in terms of the incidence of bystander first aid practices and patient's outcomes. Another recommendation this study raised are wide spreading of the first aid education programs to whole sections of the community with collaboration of the various associations and foundation.

Acknowledgement

Supported in part by grant 0001 403001 of the Hacettepe University Scientific Researches Department, Turkey.

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