Journal of Health Sciences Arel University, 7(3), 141-147
Arel Üniversitesi Sağlık Bilimleri Dergisi, 7(3), 141-147

JOURNAL OF HEALTH SCIENCES AREL UNIVERSITY

AREL ÜNİVERSİTESİ SAĞLIK BİLİMLERİ DERGİSİ

Homepage (Web sayfası): https://dergipark.org.tr/en/pub/arsagbil

Research manuscript

Evaluation of the Effectiveness of the First Aid Training Program about Daily Injuries for School Children

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Abstract

The purpose of the present study was to assess the efficiency of the training program in the management of specific injuries for children. This school-based quasi-experimental study was conducted with 131 children aged 8-11. The first-aid training program included the most frequent emergency situations the children possibly encountered at school or in their daily lives. The training program consisting of eight modules covered theoretical knowledge, videos, songs, and performing of required skills in a given scenario companied by the clown. Theoretical knowledge and practical skills were assessed via a questionnaire developed for the study and observations. The mean age of the participants was 8.18±2.82 years and 52.6% were girls. The rate of students answering the questions of information form correctly in the pretest ranged between 20.6% - 81.7% whereas it varied between 71.8% - 100% in the posttest. The success rates of students in assessing practical skills were 85% for reporting emergency situations, 100% for epistaxis, 82% for bleeding and 86% for airway obstruction. This training program effectively acquired the required skills for specific medical conditions.

Keywords: Children, First aid, Injury, Primary school, School-based training

Okul Çocuklarına Yönelik Günlük Yaralanmalarda İlk Yardım Eğitim Programının Etkinliğinin Değerlendirilmesi

Özet

Bu çalışmanın amacı, günlük yaşamda sıklıkla karşılaşabilecek yaralanmaların yönetimi konusunda okul çocuklarına yönelik hazırlanan eğitim programının etkinliğini değerlendirmektir. Okul temelli yarı deneysel bu çalışma, 8-11 yaş arası 131 öğrenci ile gerçekleştirildi. İlkyardım eğitim programı, çocukların okulda ve günlük yaşamda en sık karşılaşacağı acil durumları içeriyordu. Bunlar; burun kanaması, burkulmalar, kırıklar, yanık, arı sokması, kesikler ve solunum yolunda yabancı cisim. Sekiz modülden oluşan eğitim programı teorik bilgi, video, şarkı ve palyaçonun eşlik ettiği senaryoda çocukların becerileri uygulamasını içeriyordu. Eğitim sonunda bilgi ve beceriler, çalışma için geliştirilen anket formu ve gözlem yoluyla değerlendirildi. Katılımcıların yaş ortalaması 8.18±2.82 yıldı ve %52,6'sı kızdı. Bilgi formundaki soruları ön-testte doğru cevaplayan öğrencilerin oranı %20.6 - 81.7 arasında değişmekte iken son-testte %71.8 - 100 arasında değişiyordu. Eğitim sonrası beceriler değerlendirildiğinde, katılımcılar, acil çağrı bildirmede %85, burun kanaması %100, kanamalarda %82, solunum yolu tıkanmalarında %86 başarılı oldular. Artan yaşla birlikte teorik bilgi ve becerilerde başarı da arttı ancak cinsiyetler arasında farlılık yoktu. Yaşa uygun ilkyardım eğitimleri, öğrencileri günlük yaşamda öngörülemeyen yaralanmalara hazırlamada faydalı olacaktır.

Anahtar Kelimeler: Çocuklar, İlk yardım, Okul temelli eğitim, Yaralanma

Received: October 03, 2023 **Accepted:** October 08, 2023
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Journal abbreviations: J. H. Sci. Arel U.
Arel Ü. S. Bil. Derg.

1. INTRODUCTION

Injuries and accidents occurring among school-age children are widely accepted as an important health problem (Krug et al., 2000; Frederick et al., 2006). School age children are frequently exposed to sprain and strains, fractures, burnings, insect stings, drowning, epistaxis and epileptic seizures (Dasgupta et al., 2014; Abd El-Hay et al., 2015; Mobarak et al., 2015). First-aid support in injury and accident conditions is crucial to minimize the outcomes of the injuries and even to save their lives. Managing those conditions appropriately may possibly help to decrease mortality and morbidity rates. When someone is injured, the interventions performed by himself or others around reduce the severity of the injury. Furthermore; preparing students to provide immediate aid for themselves and others will be a big step for a more secure society (Abd El-Hay et al., 2015; Reveruzzi et al., 2020). First aid requires a certain degree of knowledge and particular skills to assess and decide about an emergency situation. Training is needed to be received for the proper intervention in emergency cases otherwise incorrect interventions might lead to undesired results. When the studies on first-aid training for children are examined, most focus solely on CPR training, but first-aid does not include only CPR training (De Buck et al., 2015; Lubrano et al., 2005).

Childhood injuries are one of the causes of child death worldwide. Children are exposed to many dangers in their casual lives and they are defenseless to those dangers. If they are equipped with appropriate knowledge and skills during this period, the number of injuries might be minimized and rates of injury-related morbidity and mortality can be reduced significantly (Wilks and Pendergast, 2017; Panda et al., 2019). It is highly important that children acquire first-aid knowledge and skills complied with their development period to help themselves and others (Bernardo et al., 2002). The studies demonstrated that children between the ages of 5 and 18 could learn specific first-aid techniques (Cimpoesu et al., 2012; Bánfai et al., 2019). In addition; there is a consensus that first aid training should be age-appropriate (Bernardo et al., 2002; Frederick et al., 2006; De Buck et al., 2015). As the first step, calling for help and assessing the situation might be taught to younger children and advanced skills might be added as they age.

In primary school students might be taught to treat superficial injuries such as epistaxis or burning; in secondary school period, they might be taught first-aid interventions in drowning cases or bandage applications and in high school students might acquire particular skills such as intervening in a nonbreathing and unconscious person (Bollig et al., 2009). Children's being equipped with the required knowledge and skills at an early period of their lives will lead to awareness and cognitive preparation as well as increasing self-esteem and a feeling of contributing to society.

2. METHODS

Aim. The purpose of the current study was to assess the efficiency of a training program designed for the management of specific injuries for 8 to 11 11-year-old children.

Design and sampling. This school-based quasi-experimental study was carried out with a sample including 2nd, 3rd and 4th grade students in a public school in the eastern part of Turkey. All the children in selected classes were included in the study. Only the ones who did not volunteer to participate and did not have written permission from their parents were excluded.

2.1. Preparation of Training Program

The training program prepared for primary school students included the most frequent emergency cases they might encounter daily. The program focused on eight issues: definition of first and reporting emergency situations, epistaxis, sprains, burns, fractures, bee stings, cuts and foreign bodies in the airway. Teaching materials for those modules were PowerPoint presentations, videos, booklets, songs, and realia such as bandages or splints.

The program consisted of 10 modules and each of the modules lasted for 60 min. The content of the modules was as follows: theoretical knowledge for 10 min; revision of theoretical

knowledge with a song for 5 min; performing the skill on the clown for 10 min and practicing the skill on a scenario based on clowns being the patient and children's being the rescuer for the rest of the time. In each module, the clown companies the researcher to practice the skills following the theoretical knowledge. Meanwhile, a song was prepared and complied with the content of each module and theoretical knowledge was revised by singing the song by the clown-instructor and students. By using the clown, it is aimed at teaching the students with fun. At the end of the program, all the students were delivered a booklet. The booklet contained all the training topics and was provided to refresh the knowledge. The training was performed as one module a week by the nurse researcher having the certificate of first-aid instructor.

2.2. Procedure

Before starting the training program, the First-aid Knowledge Questionnaire pre-test was applied. In the training program, one module was performed each week. Following the theoretical training through PowerPoint presentations and videos by the nurse researcher having the certificate of the first-aid instructor, skills of the modules were demonstrated on the clown. Each of the students practiced the skills of the modules after theoretical and practical training. The practicing of the skills was performed via a scenario in which the clown played the role of an injured. The nurse and another researcher observed the students while they were practicing the skills and a "Performance Checklist" was filled out for each student. While the researchers were observing the skill, it was marked as two points if the skill was fully implemented, one point if it was applied incompletely, and zero if it was not performed. At the end of the observation, the scores of both observers were compared and the skills given two points by both were accepted as fully implemented. A post-test was performed for that module 2 weeks after each module was completed, and the section of the First-aid Knowledge Questionnaire was used for that module in this post-test.

2.3. Measures

Demographic questionnaire. The researchers developed it to collect relevant data about the socio-demographic characteristics of children such as age, gender, etc. The form included ten questions.

First-aid knowledge questionnaire. It was prepared by the researchers in the light of literature to measure the pre-posttest knowledge level of students and adjusted according to the views of experts. The form consisted of 15 multiple-choice items and the evaluation of the form was made by considering the percentage of students who answered each item correctly. The content validity of the tool was tested by seven experts from different fields of nursing. The experts' answers ranged from 1 to 4 (1=not relevant, 2=little relevant, 3=relevant, 4=strongly relevant) and the validity of the questionnaire according to the expert opinion was 92%. To evaluate the comprehensibility of the questionnaire, a pilot study was conducted with ten students.

Performance checklist. It was prepared by the researchers in the light of literature to assess the first-aid skills of students at the end of the training program and adjusted according to the views of experts. The form, including 46 items, was filled by the researcher by observing students practicing the skills. The score of the form ranged between 0-100 and higher scores were associated with more skills practicing correctly.

2.4. Statistical Analysis

In data analysis, SPSS version 22 was utilized. Descriptive statistics were expressed as averages, standard deviation, numbers and percentages. The number of correct answers between pre-posttest was compared in terms of statistical significance using McNemar's Chi Square Test. Since the data did not have a normal distribution, the Whitney U test was applied in pair group

comparisons and Kruskal-Wallis analysis compared to more than two groups. p<0,05 value was accepted as statistically significant.

3. RESULTS

In the current study, 131 children in total were trained and 52.6% of them were girls. The mean age of the participants was 8.18±2.82 years. Theoretical knowledge in the posttest was increased significantly for all items ($p < 0.05$). All the children reported the call number of emergency service correctly at the post-training stage and the majority (80.2%) of them knew what they should report during an emergency call. The rate of students responding to the items correctly in the pretest ranged between 20.6 - 81.7% whereas it was between 71.8 and 100% in post post-test. While 44.3% of the participants reported in the pretest that first-aid was provided only by doctors and nurses, in the posttest 94.7% of them stated that first-aid could be provided by anyone around.

In the pretest, the least correctly responded items were information provided during an emergency call (20.6%), bleeding (22.9%), epistaxis (31.3%), sprains and strains (38.9%) and foreign body in the airway (38.2%) respectively. In the posttest on the other hand those rates increased dramatically as follows: information provided during an emergency call (80.2%), bleeding (90.8%), epistaxis (89.3%), sprains and strains (92.4%) and foreign body in airway (86.3%). The rates of correctly responding to the items of the First-Aid Knowledge Questionnaire were presented in Figure 1.

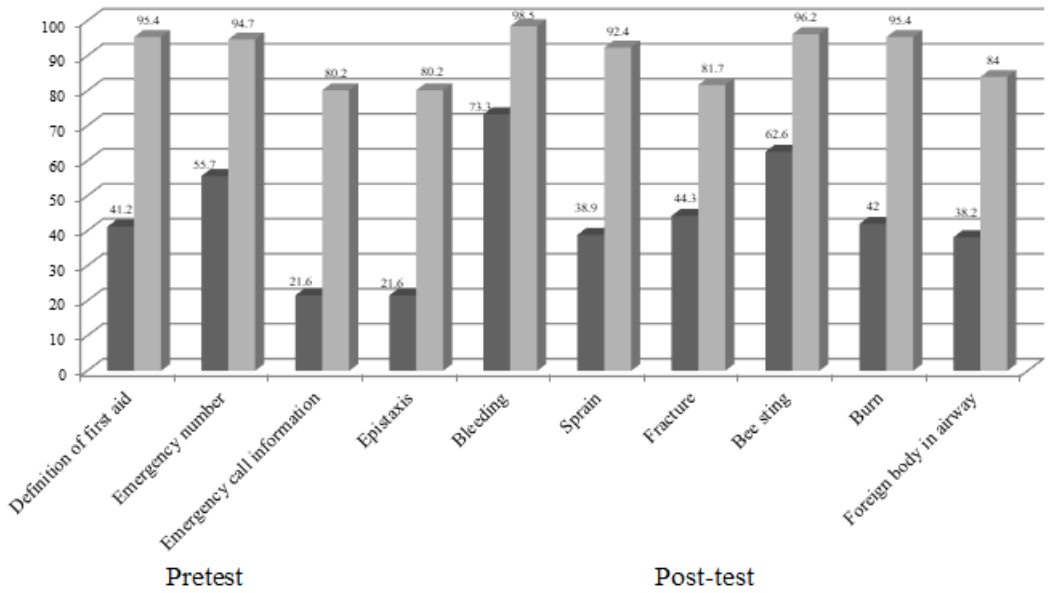

Figure 1. The rates of correctly responding to the items of the first-aid knowledge questionnaire

As for the assessment of the skills, students were successful in reporting emergency cases (85%), epistaxis (100%), bleeding (82%), and performing first-aid in airway obstruction (86%). First-aid skills performances are presented in Table 1. Scores of practicing skills differed regarding the age of the participants and the scores increased significantly in direct proportion to the period. In total skills, girls succeeded 89.7% and boys did 88.2% which indicated no significant difference between genders.

Table 1. Achievement performances of skills after training

Skills	**%**
Definition of first aid	100
Emergency call information	85
Epistaxis	100
Bleeding	82
Sprain	100
Fractures	84
Bee sting	100
Burnings	82
Foreign bodies in airway	86

4. DISCUSSION

The present study targeted to assess the efficiency of first-aid programming in certain situations for school-age children. The training program included primary injuries experienced by children in their daily lives such as epistaxis, strains, fractures, burns, bee stings, bleeding and foreign bodies in the airway. It was rather crucial that the training program should involve practical/interactive components that complied with their developmental stages. In school-based studies, educational materials are essential tools and various materials were utilized in our study with respect to their developmental stages such as videos, songs, a booklet and the practicing phase including the participation of a clown.

Correctly applied first-aid interventions are often adequate for specific injuries and accidents encountered in daily life (Lubrano et al., 2005; Fleischhackl et al., 2009). Children might demand help at younger ages and perform first-aid skills successfully (Bottiger and Van Aken, 2015). Even though there are not any specific borders for children about which first-aid skills they can perform at certain ages, basic first-aid skills should be gained an early age as recommended by the developmental approach (Lubrano et al., 2005). Meanwhile, early training forms a basis for future training programs and enhances the knowledge, ability and eagerness levels about first-aid in emergencies. The results of the current study demonstrated that children implemented the basic first-aid skills following the provision of theoretical knowledge, and practice and the success levels in the performing of skills increased complied with the age. The studies conducted by Lubrano et al. (2005) and Bolling et al. (2009) indicated similar results. The study's results demonstrated that first-aid training might begin in primary school years and its content might be expanded gradually. The results of the study suggested that before the training program, only 41.2% of the students defined first-aid correctly whereas 95.4% of them did it correctly following the training. While 81.7% of the students knew the number of emergency services before the training, all participants knew it correctly following the training program. The call number of emergency service is the first knowledge that should be taught in first-aid training to younger children and studies on this issue revealed that younger children could learn it quickly. For instance; in the study by Bolling et al. (2009) including a sample group between the ages of 6-7 years, 77% of the children learned the number of emergency services correctly. Similarly, Dasgupta et al. (2014) reported in their study that the rate of students defining first-aid was 15.2% before the training whereas it increased to 78.1% afterward. Twenty-one-six percent of the students responded to the item about the knowledge that should be transmitted during an emergency call before the training and it rose to 80.2% afterward. In the study by Banfai et al. (2019), emergency call knowledge for 7-14 years children was reported as 49% former to training and 91% following the training program. This rate was reported as 98% in the study by Fleischhackl et al. (2009). Not any significant differences occurred between genders in the responding of information form delivered in pre-posttest phases.

According to the results of the study, the success of the children in practicing the skills was remarkable. All the participants succeeded between 82% and 100% and the skill they practiced most successfully was epistaxis first-aid. It was reported as 80% in the study by Panda et al. (2019).

A high level of success in epistaxis first aid intervention is rather crucial for the efficiency of the training program as it is the most frequently encountered injury by school-age children. A significant difference occurred between age groups in terms of scores of skills that is first-aid practicing skills' mean scores in the 10-11 years age group were higher than those 8-9 years students. Similar results emphasizing the increasing level of success complied with age were indicated in various studies (Lubrano et al., 2005; Bánfai et al., 2017). The results of the current study revealed that improvement in motor and cognitive development leads to a higher level of success in first aid knowledge and skills. In addition, the results of the present study put forth that first aid training programs should definitely be planned by taking the ages of participants into consideration.

5. LIMITATIONS

One of the remarkable limitations of the current study was that the sample group was selected from a single school so it lacked out-generalizability. Another limitation of the present study was that even though a second posttest assessment was planned three months after the training to test the persistence of knowledge and skills, our attempt on this issue failed due to the closure of the schools because of the COVID-19 pandemic.

6. CONCLUSION

Results of the study indicated that school-age children were able to gain essential knowledge and skills about injuries that they could experience in their daily lives following a visual-based, interactive and practical first-aid training. Even though a consensus is generated on the issue that children should learn first-aid at an early age, not a definite answer occurred to the question "what we should teach in what age groups". In addition, the majority of studies on the issue focused on older age groups and CPR training. We believe that our results as well as the similar ones will be a guide in the defining of specific first-aid interventions according to particular age groups.

Authors Contribution

Ayfer Ekim: Conception and design, Literature review, Data analysis, Writing, Supervision. **Gamze Aksu**: Conception and design, Literature review, Data collection, Data analysis, Writing.

Ethical Approval

This study was approved by the İstanbul Arel University Clinical Research Ethics Committee dated 02.12.2019 and numbered 2019/07.

Declaration of Interests

The authors declared no potential conflicts of interest.

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