

Original Article

The Effect of the Training on Parents' Knowledge Level Regarding First Aid in Pediatric Burns

Funda Cetinkaya, PhD

Aksaray University, Faculty of Health Sciences, Department of Surgical Nursing, Aksaray, Turkey

Gamze Odabasi

Aksaray University Training and Research Hospital, Emergency Department, Aksaray, Turkey

Correspondence: Funda Cetinkaya, PhD Aksaray University, Faculty of Health Sciences, Department of Surgical Nursing, Aksaray, Turkey E:mail; fundacetinkaya@aksaray.edu.tr

Abstract

Aim: In the emergency unit, nurses and physicians witness many cases of burns that can be prevented with various first aid measures. Morbidity rate reduces in burns that are intervened immediate and effective. Thus, it is important to evaluate first aid knowledge in order to prevent burns and to prevent mistakes made in case of burns. This study was conducted determine the level of knowledge of parents regarding first aid in burns and assess the effectiveness a simple educational intervention in the knowledge of parents regarding pediatric burns first aid.

Methods: The study was carried out using a single-group pre-test/posttest design. The data was collected between June and December 2018. The data of the study was collected using a two-part survey form developed by researchers in accordance with the relevant literature.

Results: The mean age of the parents was 34.01 ± 8.37 . The total score of the correct answer of the parents regarding first aid knowledge was statistically significant post-intervention than pre-intervention ($p = 0.000$).

Conclusions: The right first aid intervention is important to protect and improve public health. In this study, simple first aid training improves knowledge and attitude efficacy of the parents in burns.

Keywords: Burns; Pediatric; Parents; First aid; Nurse

Introduction

Childhood injuries from incidents and accidents are a growing concern for public health. According to the data of the World Health Organization, among the causes of death of children aged 1-4, falls are in the 8th place and burns are in the 11th place (http://www.who.int/healthinfo/global_burden_disease). Burn injury with serious physical, functional, and psychosocial consequences is a universal public health problem. Worldwide, 180,000 people die from burns each year, mostly in low and middle-income countries (<https://www.who.int/news-room/fact-sheets/detail/burns>). Childhood burns are the third most common form of injury (Thein, Lee & Bun, 2005), and it is estimated that more than 500,000 children worldwide are hospitalized with burn injuries each year (Brown et al., 2015). Although there is no burn percentage for our country, the literature according to different

settlements among the causes of childhood accidents and burns are in the 2nd and 4th ranks (İnanç, Şahin & Demir, 2013). Burns are injuries that result in serious deaths in children aged 0-19 and rank 13th among the causes of death (Gurler & Yildiz, 2019). The most common sources of pediatric burn injuries are scalding, flame burn and electrical injuries (Alomar, Rouqi & Eldali, 2016). Pediatric burns are well known to differ from adult burns. In pediatric burns, areas such as head, face, hand, and perineum are affected and the tendency to sepsis associated with infection increases (Karaoz, 2010). Childhood burn injuries are an important problem due to both the difficult treatment process and the physical and psychological trauma experienced by child and parents (Kurane & Ugane, 2014; Kavurmacı & Kucukoglu, 2015). Burns in childhood creates a serious trauma regardless of the child's age; it requires comprehensive care that can take months with a multidisciplinary team approach to reduce

complications and return to the best functional state (Ozer & Vural, 2018). The most inexpensive and effective method of dealing with this trauma is to prevent burns before they occur. For this reason, some safety measures should be put in place and parents' awareness of this issue should be enhanced to protect (Kavurmacı & Kucukoglu, 2015). When a burn occurs, immediate management of the burn injury involves providing the correct first aid. Appropriate first aid is an important part of emergency medical management of burns aimed at reducing the severity of injuries, removing harmful agents, reducing pain and reducing the risk of infection and oedema (Nurmatov et al. 2018). Also corrects first aid in burns provides limited tissue damage and subsequent morbidity (Atiyeh, Masellis & Conte, 2009). The recommended first aid intervention after a burn injury is to immediately stop the burning process, remove clothes or jewelry near the burned area, cool the burn area with cold or warm water for 15-20 minutes, keep the patient warm and seek professional help (Alomar, Rouqi & Eldali, 2016; Chirongoma, Chengetanai & Tadyanemhandu, 2017). However, many studies have shown insufficient in knowledge and practice in first aid of burns in both developed and developing countries (Kavurmacı & Kucukoglu, 2015; Graham et al. 2012; Davies et al. 2013). In previous studies was stated that parents were insufficient in using cold water therapy, using the optimum treatment period (Graham et al. 2012; Rawlins et al., 2007), and applied to use ice (Skinner & Peat, 2002) instead of cold water application or cooling for too long, which increases the risk of hypothermia in children (Bartlett et al., 2008). In addition, it has been stated that caregivers tend to use inappropriate topical agents, toothpaste, olive oil, cream and lotion (Skinner & Peat, 2002; Cuttle et al. 2009; Graham et al. 2012; Kavurmacı & Kucukoglu, 2015; Ozyazicioglu, Polat & Bicakci, 2011). Reducing the severity of burns after the burn, improving the clinical outcome, reducing pain, removing physical disorders can be provided when appropriate first aid is provided (Nurmatov et al. 2018; Lam et al. 2017). For these reasons, parents should be given appropriate first aid training in burns based on simple, reliable and evidence-based information (Nurmatov et al. 2018). Pediatric burns first aid is a critical issue that needs more work to reduce the severity of pediatric burns and to ensure and improve the

correct interventions in case of burns (Ying, Yuan & Jonathan 2016).

The objective of this study was to identify the level of knowledge of parents regarding first aid in burns and assess the effectiveness a simple training intervention in the knowledge of parents regarding pediatric burns first aid. The results of the study will help develop parents' first aid training and practices for the prevention and treatment of burn injuries at home.

Methods

Design: This quasi-experimental research was conducted with pretest and posttest applied to the same group.

Sample: This study was carried out between June and December 2018 in a child emergency of a Training and Research Hospital in Turkey. The sample of the study consisted of 102 parents who have 0-12 age group children and admit to the child emergency because of a health problem other than burns.

Measures: The data of the research were collected using a two-part questionnaire form developed by the researchers in accordance with the relevant literature (Alomar, Rouqi & Eldali, 2016; Karaoz, 2010; Kavurmacı & Küçükoğlu, 2015). In the first part, there are 9 closed-ended questions regarding parents' sociodemographic data. The second part includes 16 closed-ended (yes / no) questions aimed at evaluating parents' first aid information in burns. A preliminary application was made on 10 parents to test the adequacy and clarity of the questionnaire prepared in the research. Individuals within the scope of pre-application were not included in the study.

Ethical Considerations : This study was carried out in accordance with the Helsinki Declaration principles. Prior to the application of the research, written permission from the University Human Research Ethics Committee (2018/103, Date: 20.04.2018) and from the studied from Education Research Hospital was taken.

Intervention: The study was performed by the researchers after treatment attempts were made to minimize the discomfort that may occur in individuals and to provide a comfortable environment after the child was taken to the observation room patients through the face to face interview method (pretest).

After the pretest was parents about 10 to 15 minutes of education with a simple educational poster. A simple training leaflet was used, which

includes what "should do" and "should not be done" in first aid in the injury of burns to parents. The brochure consisted of a flowchart that included information and visually guided individuals in the right steps of the burn first aid before the pictures and medical help of trained professionals for easy understanding. The education lasted approximately 10 minutes.

After, the parents would complete the questions in the post-education segment. This was done before being discharged from the emergency room. Throughout the entire process, parents were accompanied by research to provide any form of assistance such as the explanation of the terms used. It took about 15 minutes to answer the questions in the questionnaire and individuals were not forced to rush to answer the questions in the questionnaire.

Statistical analysis: In the evaluation of the data was used SPSS 16.0 package program. Descriptive tests (percentile, arithmetic mean, standard deviation, min-max values) tests were used in the analysis of individual characteristics, and a paired t test was used to compare the pretest-posttest mean scores. In comparison, $p < 0.05$ value was considered statistically significant.

Results

Table 1 describes the general characteristics of the study patients; where their mean age was 34.01 ± 8.37 , parents in the study were female 86.3% ($n = 88$), most of them have secondary school education level 52.9% ($n = 54$), housewives 71.6% ($n = 73$).

Half of the parents have first aid information, 46.1% ($n = 47$) of them exposed to burn injury, 61.7% ($n = 29$) of the children exposed to burn injury are at the age from 1-3 years old. It was determined that 51.1% ($n = 24$) were injured by scalding, 46.8% ($n = 22$) by flame, 2.1% ($n = 1$) by electrical burn. In the first intervention of the parents whose children were exposed to burns, stated that they immediately took them to the hospital 36.2% ($n = 17$) and applied cold 29.8% ($n = 14$) (Table 2).

The averages of the correct answers given by the parents to the cases that should and should not be done regarding burn injuries before and after the education regarding the burn injury are given in Table 3.

Regarding parents' knowledge, basic first aid measures, Table 3 presenting; a significant increase in the mean score of average of the total correct answers in the post-intervention than pre-intervention ($p = 0.000$; Table 3).

Table 1. General characters of the studied parents

Variables	n (102)	%(100.0)
Parents' Age (years) Mean±SD	34.01±8.37	
Range	20-55	
Gender		
Female	88	86.3
Male	14	13.7
Educational level		
Primary education	12	11.8
Secondary education	54	52.9
High school	24	23.5
University and above	12	11.8
Occupation		
Housewives	73	71.6
Working	29	28.5

Table 2. Parents encounter in burns and first aid applications in burns

	n=102	%(100.0)
First aid information on burn		
Yes	51	50
No	51	50
Parents' burn exposure in children		
Yes	47	46.1
No	55	53.9
Age of child with burn injury (n=47)		
1-3 years	29	61.7
4-6 years	13	27.7
7-9 years	1	2.1
10-12 years	4	8.5
What kind of burn injury (n=47)		
Flame burns	22	46.8
Scalds burns	24	51.1
Electrical burns	1	2.1
What is done in the first intervention in case of burn (n=47)		
I took him to the hospital	17	36.2
I asked for help from 112	1	2.1
I applied cold	14	29.8
Toothpaste, egg white drove	2	4.3
I didn't make any applications	1	2.1
I applied cold and burned cream	3	6.4
I applied cold and applied yogurt	3	6.4
I applied cold and egg white	3	6.4
I took yogurt and took him to the hospital	2	4.3
I drove olive oil	1	2.1

Table 3. Parents' information on first aid in burns

Items	Pre-test	Post-test	Score of change	^{a*} p
I immediately immerse the burn area in the water for an average of 15-20 minutes on the scald burn	0.74±0.43	1.00±0.00	0.25±0.43	0.000
I immediately apply ice to the burn area on the scald burn	0.66±0.47	0.92±0.27	0.25±0.53	0.000
In the burns caused by scalding and flame, I apply egg whites to the burned area.	0.92±0.27	0.94±0.23	0.01±0.37	0.595
In burns caused by scalding and flame, I apply herbal herbs to the burn area.	1.00±0.00	1.00±0.00	0.00±0.00	
In burns caused by scalding and flame, I immediately apply petroleum jelly or burn cream to the burn area	0.71±0.45	0.76±0.42	0.04±0.65	0.448
I burst water bubbles in burn injury and peel off the bubbles	0.99±0.09	1.00±0.00	0.01±0.99	0.320
For burns caused by scalding and flame, I apply toothpaste to the burn area	0.90±0.29	0.96±0.19	0.05±0.36	0.109
I ensure my own safety and take the child away from the fire, and put it in a safe environment.	0.61±0.48	0.80±0.39	0.18±0.64	0.004
I remove the clothes in the burn area without adherent to the body. If it adherent, I cut and then removed carefully	0.23±0.42	0.97±0.16	0.73±0.48	0.000
I apply aloe vera in the burn area.	0.97±0.16	1.00±0.00	0.02±0.16	0.083
In scalding and flame burns, I apply tomato paste to the burn area.	1.00±0.00	1.00±0.00	0.00±0.00	
For scalding, flame or sunburn, I apply yogurt to the burn area	0.82±0.38	0.90±0.29	0.07±0.52	0.131
In scalding and flame burns, I apply cold to the burn area and take it to the	0.80±0.39	0.87±0.33	0.06±0.51	0.179

hospital immediately.				
In second and third degree burns, I take it to the hospital without wasting time.	0.76±0.42	0.81±0.39	0.04±0.63	0.438
Behaves calmly in electrical burns, I cut the current before touching it and takes it to a safe environment, check the signs of life, seek medical help	0.68±0.46	0.91±0.28	0.22±0.56	0.000
In burns caused by the chemical, I take off the clothes to remove the substance and wash the area where the chemical is in contact with water for 10 minutes.	0.61±0.48	0.73±0.44	0.11±0.61	0.057
Total Knowledge Score	12.46±2.13	14.59±1.54	2.13±2.62	0.000

*p<0.001, ^aPaired t-test was computed

Discussion

Immediate and effective first aid after burns significantly reduces pain and tissue damage size, accelerates burn recovery, and increases survival rate (Alomar, Rouqi & Eldali, 2016; AlQahtani et al., 2019). Parents play an important role in providing a safe environment for children to minimize or prevent injuries and first aid in case of injury in practice (Kavurmaci & Kucukoglu, 2015). This study was conducted among 102 parents having children of 0-12 years old to assess the effect of a basic and short education intervention on their knowledge and attitude of about the basic first aid in the burns.

In this study was determined that half of the parents (50%) had first aid knowledge. In previous studies, it was reported that the majority of mothers have first aid knowledge (Uskun et al., 2008; Dereli, Turasay & Ozcelik, 2010; Hatamabadi et al., 2014). Some previous studies, unlike the results of the study was reported mothers or childcare providers have insufficient knowledge about first aid (Thein, Lee & Bun, 2005; Singer et al., 2004). Parents' children were exposed (46.1%) burn injuries. Among the burn injured children, the age from 1-3 years was the most affected. Similarly, in a study Inanc et al. (2013), children were found mostly age from 1-3 years in the burn injuries. This study has shown that the training provided in the emergency unit is effective in increasing the first aid knowledge of parents in burn cases. When the average score was evaluated over a total of 16 items, the average increased from 12.46 ± 2.13 before to 14.59 ± 1.54 after the training. When the average score was evaluated over a total of 16, the average increased from 12.46 ± 2.13 training to 14.59 ± 1.54 after training. In their study, El Seifi et al. (2018) were found that mothers' knowledge scores first aid increased significantly after training. Ying et al. (2016), stated that there was

a statistically significant increase in the level of first aid knowledge after training of burners in burn injuries in their first aid training to caregivers in Singapore. In the study of Ozturk et al., (2010) there was no statistically significant difference between the first aid knowledge levels of the mothers participating in first aid training.

The current recommendation for first aid applications in burns is the application of all types of thermal burns to 20 minutes of water in the flowing water at a temperature of 2 to 15 degrees. It also states that nothing should be applied to the burn wound other than water. This application is applied effectively in the first hour of injury and up to 3 hours from the time of injury (Alomar, Rouqi & Eldali, 2016; Varley, Sarginson & Young, 2016; AlQahtani et al., 2019). The cooling process has many potential benefits. Reduced mortality is associated with pain relief and improved wound healing and decreased cellular damage (Bennett et al., 2019).

In cohort study of 2320 individuals by Wood et al. (2016), were found that 20 minutes of water application as a first aid intervention significantly reduced the need for grafts and intensive care, burn depth, reepithelization time and mortality. In this study, the parents' right to burn the burnt area in a scalding burns immediately, the average of correct response increased from 0.74 before training to 1.0 after training (p = 0.000). Similarly in other studies reported that parents' applied cold water to the burn area (Ying, Yuan & Jonathan, 2016; Chirongoma, Chengetanai & Tadyanemhandu, 2017).

In the literature and studies are stated that direct ice application to the burn wound increases the severity of the burn by causing vasoconstriction in the burn area and causes hypothermia and shock (Davies et al., 2013; AlQahtani et al., 2019; Kilic, Polat & Cimen, 2013). In this study,

it was reported that the average correct answer given to the question "I apply ice to the burn area immediately" increased from 0.66 before training to 0.92 after training ($p = 0.000$).

In this study, although the difference between the correct answer before and after training in the burn area used by the parents in the burns, petroleum jelly or burn cream, toothpaste, aloe vera, and yogurt was not statistically significant, the mean score of correct answer after training increased ($p > 0.05$). Ozyacioglu et al. (2011), stated that the traditional approach (applying yogurt, tomato paste and paste) after training decreased in the study in which he evaluated the effect of training given for the first aid application in the burn in the traditional approaches of mothers. Gurler and Yildiz (2019) had stated in his study that the mothers were not applying the correct first aid intervention in the event of burns and that the mothers used substances such as yogurt, ice, olive oil, toothpaste, tomato paste, apple peel, raw egg white, onion and burn ointment. In his study, Karagoz (2010) also showed that most parents do not apply correct first aid in the event of burns.

Trying to remove adherent clothing can cause large skin tissue losses; therefore, the clothes must be cut and then carefully removed (Kavurmaci & Kucukoglu, 2015; Boyraz & Gokce, 2015). In this study "I remove the clothes in the burn area without adherent to the body. If it adherents, I cut and then removed carefully" while the average correct answer before training was 0.23, it increased to 0.97 after training. In the study of Phenk Hui et al. (2016) evaluating the attitudes of families in pediatric burns, they found that there was a need to raise the awareness of the parents about the peeling of warm clothes and appropriate cooling times.

All electrical burns are in the group of serious injuries that require further treatment in the hospital after their first intervention (Boyraz & Gokce, 2015). In this study, parents' pre-education "Behaves calmly in electrical burns, I cut the current before touching it and takes it to a safe environment, check the signs of life, seek medical help" increased from 0.68 to 0.91 after training. These results support the effectiveness of the training given to parents.

Conclusion: First aid can reduce mortality and disability rates with proper intervention in the event of an accident. First aid is a treatment that requires knowledge and mistakes are not

acceptable. If first aid is given by people who are not properly trained, this can have serious negative consequences. For this reason, first aid training of individuals in the community is required to provide the correct assistance in cases where it is likely to be in a situation to implement it. It is important for nurses to educate individuals in society about the right first aid to protect public health. Burn injuries are common in children and high mortality rates. Nurses have a primary role in the education of parents' and in facilitating the psychological adjustment of the patient's in the first aid applications required for burn injuries. Due to the limited knowledge of the parents about harmful practices, erroneous practices performed during the first intervention may make evaluation and treatment procedures in the emergency care difficult. Since the correct application of first aid prevents the negative situations that may occur, short training can be given and distributed by the emergency nurse to the parents. In this way, it becomes common for individuals in the community to make correct first aid in burn injuries.

The results of this study showed that the application of simple first aid training regarding pediatric burns among parents having 0-12 age group children, improves their knowledge and attitude about first aid in burns.

Limitations of the Research: This study had some limitations. The research was conducted in one center only and one group. After training on first aid in burns, the application of posttest data before the parents leave the emergency unit has created time differences in collecting posttest data.

Acknowledgments: The authors acknowledge the participants for their cooperation.

References

- Alomar M, Rouqi FA & Eldali A. (2016). Knowledge, attitude, and belief regarding burn first aid among caregivers attending pediatric emergency medicine departments. *Burns*, 42 (4) 938-943.
- AlQahtani FA, Alanazi MA, Alanazi MK, Alshalhoub KS, Alfarhood AA & Ahmed SM. (2019). Knowledge and practices related to burn first aid among Majmaah community, Saudi Arabia. *J Family Med Prim Care*, 8(2):594-8.
- Atiyeh B, Masellis A & Conte C. (2009). Optimizing burn treatment in developing low-and middle-income countries with limited health care resources (part 1). *Ann Burns Fire Disasters*, 22:121-125.

- Bartlett N, Yuan J, Holland AJ, Harvey JG, Martin HC, La Hei ER, Arbuckle S & Godfrey C. (2008). Optimal duration of cooling for an acute scald contact burn injury in a porcine model. *J Burn Care Res*, 29(5):828–834.
- Bennett CV, Maguire S, Nuttall D, Lindberg DM, Moulton S, Bajaj L, Kemp AM & Mullen S. (2019). First aid for children's burns in the US and UK: An urgent call to establish and promote international standards. *Burns*, 45(2):440-449.
- Boyraz, S., Gokce, S. (2015). First Aid in Situations Causing Consciousness Impairment. Hicran Yildiz, Emine Çatal (Ed.), *First Aid*, (p.159-172). Undergraduate Publishing, Istanbul.
- Brown NJ, David M, Cuttle L, Kimble RM, Rodger S & Higashi H.(2015). Cost-Effectiveness of a Nonpharmacological Intervention in Pediatric Burn Care. *Value in Health*, 18(5):631-637.
- Chirongoma F, Chengetanai S & Tadyanemhandu C.(2017). First aid practices, beliefs, and sources of information among caregivers regarding paediatric burn injuries in Harare, Zimbabwe: A cross-sectional study. *Malawi Medical Journal*, 29 (2): 151-154.
- Cuttle L, Pearn J, McMillan JR & Kimble RM. (2009). A review of first aid treatments for burn injuries. *Burns*, 35(6):768–75.
- Davies M, Maguire S, Okolie C, Watkins W & Kemp AM. (2013). How much do parents know about first aid for burns? *Burns*, 39 (6):1083–90.
- Dereli F, Turasay N & Ozcelik H. (2010). Determinations of the First Aid-Related Knowledge Levels of the Mothers Having Children at the Age of 0-6 and Who Live in The Mugla Number Two Health Clinic Distric. *TAF Prev Med Bull*, 9(3):217-224.
- El Seifi OS, Mortada EM & Abdo NM. (2018). Effect of community-based intervention on knowledge, attitude, and self-efficacy toward home injuries among Egyptian rural mothers having preschool children. *Plos One*, 21:1-11.
- Graham HE, Bache SE, Muthayya P, Baker J & Ralston DR. (2012). Are parents in the UK equipped to provide adequate burns first aid? *Burns*, 38(3):438-443.
- Gurler H & Yildiz İ. (2019). First Aid Intervention and Knowledge Applied by Mothers of Children with Burn. *JCP*, 17(2):232-242.
- Hatamabadi HR, Mahfoozpour S, Alimohammadi H & Younesian S. (2014). Evaluation of factors influencing knowledge and attitudes of mothers with preschool children regarding their adoption of preventive measures for home injuries referred to academic emergency centres, Tehran, Iran. *International Journal of Injury Control and Safety Promotion*, 21(3):252-259.
- Inanc BB, Sahin DS & Demir C. (2013). 1-6 Years Aged Childrens' Mothers' First Aid for Burns Observation in Mardin City Center. *Journal of Clinical and Analytical Medicine*, 4(3): 175-178.
- Karaoz B. (2010). First-aid home treatment of burns among children and some implications at Milas, Turkey. *J Emerg Nurs*, 36:111-114.
- Kavurmacı M & Kucukoglu S. (2015). Determination of the Pre-Hospital Practices Performed for Children with Burn Injuries. *Journal of Clinical and Analytical Medicine*, 6(suppl 6): 806-810.
- Kilic M, Polat S & Cimen S. (2013) *Fluid Electrolyte Balance and Disorders in Children*, Conk Z, Basbakkal Z, Balyilmaz H, Bolisik B (Ed), Pediatric Nursing. 1st Edition, Ankara, Academician Medical Bookstore, 208-214.
- Kurane SB & Ugane S. (2014). A Retrospective Study of Pediatrics Burns at General Hospital in Rural India. *International Journal of Medical Science and Public Health*, 10(3):1235-1237.
- Lam NN, Li F, Tuan CA & Xuan Huong HT. (2017). To evaluate first aid knowledge on burns management amongst high risk. *Burns Open* 1, 29–32.
- Nurmatov UB, Mullen S, Quinn-Scoggins H, Mann M & Kemp A. (2018). The effectiveness and cost-effectiveness of first aid interventions for burns given to caregivers of children: A systematic review. *Burns*, 44(3):512-523.
- Ozer NG & Vural F. (2018). Effect of Childhood Age Features on Burn and Care Recommendations for Burned Children. *DEUHFED*, 11 (3): 257-260.
- Ozturk C, Sarı HY, Bektas M & Elcigil A. (2010). Home accidents and mothers measurements in preschool children. *Anatol J Clin Investig*, 1:15-21.
- Ozyazıcioglu N, Polat S & Bıçakcı H. (2011). The effect of training programs on traditional approaches that mothers use in emergencies. *J Emerg Nurs*, 37:79-85.
- Phenk Hui JK, Allen JC & Jones Mok WL.(2016). Attitudes on first aid for paediatric burns: Pilot survey of a developed city state. *Burns*, 42:926-937.
- Rawlins JM, Khan AA, Shenton AF & Sharpe DT. (2007). Epidemiology and outcome analysis of 208 children with burns attending an emergency department. *Emerg Med J.*, 23(5): 289-293.
- Singer AJ, Gulla J, Thode CH & Cronin AK. (2004). Pediatric first aid knowledge among parents. *Pediatr Emerg Care*, 20:808-811.
- Skinner A & Peat B. (2002). Burns treatment for children and adults: a study of initial burns first aid and hospital care. *N Z Med J.*, 115(1163):U199.
- Thein MM, Lee BW & Bun PY. (2005). Childhood injuries in Singapore: a community nationwide study. *Singapore Med J.*, 46(3):116-121.
- Uskun E, Alptekin F, Öztürk M & Kişioğlu AN. (2008). The attitudes and behaviors of housewives in the prevention of domestic accidents and their first aid knowledge levels. *Turkish Journal of Trauma & Emergency Surgery*, 14(1):46-52.

- Varley A, Sarginson J & Young A. (2016). Evidence-based first aid advice for paediatric burns in the United Kingdom. *Burns*, 42(3):571-577.
- WHO methods and data sources for country-level causes of death 2000-2015. Department of Information, Evidence and Research. Geneva: WHO; 2017. Global Health Estimates Technical Paper WHO/HIS/IER/GHE/2016.3. http://www.who.int/healthinfo/global_burden_disease/GlobalCOD_method_2000_2015.pdf?ua=1. Accessed April 19, 2020.
- Wood FM, Phillips M, Jovic T, Cassidy JT, Cameron P & Edgar DW. (2016). Steering water first aid is beneficial in humans post-burn: Evidence from a bi-national cohort study. Committee of the Burn Registry of Australia and New Zealand (BRANZ). *PLoS One*, 25(11):1-13.
- World Health Organization, Media centre, fact sheet, burns, <https://www.who.int/news-room/fact-sheets/detail/burns>, Accessed April 19, 2020.
- Ying LL, Yuan ZCM & Jonathan TWE. (2016) An epidemiological study of pediatric burns first aid and management by care givers in Singapore. Hwa Chong Institution. Singapore. http://ircset.org/anand/2016papers/IRC-SET_2016_paper_S6-1.pdf Accessed 08.12.2019.