

# Saudi parents awareness regarding burn, choking, and drowning first aid in children

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## ABSTRACT

**Background:** Children are the most affected age group by home and traffic accidents. Parents, as the primary caregiver to their children, play an important role in saving their lives during an accident, therefore, more attention should be focused to assess and improve the parents' knowledge and skills of first aid (FA). **Aim:** Determining the parent's awareness level regarding choking, drowning, and burn FA, their readiness to attend an FA course and solutions from their perspective to improve the awareness level regarding FA for children. **Methodology:** Cross-sectional analysis was conducted by using a simple random sampling that includes 300 parents attending a well-baby clinic in Wazarat primary health care center in Riyadh through self-administered questionnaires. Multiple variables were evaluated to assess their effect on the outcome. **Results:** Only 6% of the parents have a high and acceptable awareness level regarding choking, drowning, and burn FA. A lot of myths and incorrect practices are prevalent among parents regarding these injuries' management. Fortunately, two-thirds of the participants (78%) are willing to attend an FA course and 79% of them think that adding FA to school subjects is the solution for awareness improvement. **Conclusions:** Parents' knowledge level regarding FA methods of major home injuries are insufficient, therefore, more attention should be focused to improve the parents' knowledge and skills of FA in order to reduce morbidity, mortality from these injuries.

**Keywords:** Burn, choking, drowning, first aid, parents, Saudi Arabia

## Introduction

First aid (FA) was defined in 2010 by the American Heart Association and the American Red Cross Guidelines as "assessments and interventions that can be performed by a bystander or by the victim with minimal or no medical equipment."<sup>1, 2</sup> The main aim of FA is to relieve suffering, promote healing, and decrease damage. In addition, the FA that is applied in the first minutes after an injury is essential to the victims as it determines the future course of the disease and the possible complications.<sup>2,3</sup>

Unfortunately, significant time may pass until the arrival of an ambulance. Therefore, all the countries, regardless of their income, needs the introduction of FA programs to the general public in order to save lives. Consequently, the Red Cross and the Red Crescent Societies are focused on simple skills of lifesaving as an FA.<sup>4</sup>

Children are the most affected age group by traffic accidents and home accidents (HA) as well.<sup>2</sup> Burn, drowning, and choking are among the highest prevalence of injuries affecting children at home, simple and easy FA steps can save their lives after experiencing such injuries.<sup>5-8</sup>

Several worldwide investigators had studied the prevalence of FA awareness among different populations. However, in Saudi Arabia, there is an insufficiency of information regarding

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E-mail: dr.k.habeeb@hotmail.com

Received: 26-11-2019

Revised: 21-02-2020

Accepted: 03-03-2020

Published: 26-03-2020

### Access this article online

#### Quick Response Code:



**Website:**  
www.jfmipc.com

**DOI:**  
10.4103/jfmipc.jfmipc\_1064\_19

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**How to cite this article:** Habeeb KA, Alarfaj G. Saudi parents awareness regarding burn, choking, and drowning first aid in children. J Family Med Prim Care 2020;9:1370-5.

parents' awareness about child FA in addition to their readiness to participate in FA courses. Therefore, this research was conducted to assess these issues in order to understand the parents' perception regarding FA in children and eventually to improve the children's health and safety. This study is important for all physicians to achieve their duty as a health care advocate and of special importance for primary care practice to enlighten its role in community prevention through health education and opportunistic health promotion, especially as we are living the transition of the health care system structure toward the primary health care.

## Literature review

The prevalence of HA is highest among children. In the UK, 41.4% of accidents happen at home.<sup>[2]</sup> The commonest HA affects children reported in the UK were falling, cuts, burns, and suffocation,<sup>[2]</sup> a similar data were reported from a cross-sectional study in Egypt.<sup>[9]</sup> A retrospective data analysis conducted in China rated drowning and foreign body ingestion and aspiration out of the top three causes of unintentional injuries.<sup>[10]</sup> Every year 20.2 million HAs are treated by the European Union.<sup>[2]</sup> Additionally, death rates and nonfatal injury rates are highest among children aged  $\leq 4$  years.<sup>[11,12]</sup>

Drowning is a major global public health crisis; it's the third leading cause of unintentional injury deaths, accounting for 7% of all injury-related deaths.<sup>[11,12]</sup> In Saudi Arabia, one of the factors associated with the bad near-drowning outcome is delayed rescue at the scene.<sup>[13]</sup>

Burn injuries (BI), on the other hand, are the fourth most common type of injuries<sup>[13]</sup> and a major public health problem worldwide. It has high mortality and morbidity, and economic loss, even with small burns.<sup>[14,15]</sup> In the USA, the costs for care of burned children exceeded US\$ 211 million.<sup>[16]</sup> In Saudi Arabia, children up to age 10 accounting for the main burn victims (59.2%), with the majority of burns admitted to the hospital occurred at home.<sup>[17]</sup> The number of pediatric burn admissions to our hospitals in KSA is increasing every year.<sup>[18]</sup> Hospital admissions are secondary to the BI itself or due to infection in the wound area as complications of applying various substances to it. 51% of patients who experience burns apply various substances to the burn area, 33.8% of them end up with wound infection compared to those who applied nothing.<sup>[19]</sup>

Foreign body aspiration (FBA) is the fifth most common cause of unintentional-injury mortality in the USA.<sup>[8]</sup> 80% of FBA occur in younger than 3 years of children.<sup>[20]</sup> It can cause mortality in about 7% of cases besides that it is the leading cause of unintentional-injury mortality in children younger than 1 year.<sup>[8]</sup>

Despite the high prevalence of burn, drowning, and choking a lot of community sectors are still lacking the appropriate knowledge of FA that required in these situations. In Saudi Arabia, most people don't know how to apply FA

in required situations; moreover 40% don't even know the ambulance phone number.<sup>[21]</sup>

Worldwide, many educational programs had shown success in changing the population knowledge or behaviors regarding FA. After applying for the FA program, in Nepal, 2005–2006, knowledge and skills were improved from 13.9% to 70.3% among schoolteachers and school management committee members.<sup>[22]</sup> FA manual and on-spot demonstration among high school students in India show better FA knowledge 43% comparing to distributing FA manual alone.<sup>[23]</sup> Similarly in Spain CPR educational program improve high school students knowledge from 42% to 63%.<sup>[24]</sup>

Changing the community knowledge and/or behavior by the educational program has a great effect on decreasing morbidity, mortality, and cost after injury. For example, accident injury rates have decreased among factory workers after 4 h of FA training course.<sup>[25]</sup> In the UK, the first aid community training project significantly reduced the accident injury rate in the community besides the direct effect on the trained individual an indirect effect of an adult on children is observed.<sup>[26]</sup> In New Zealand, a public health campaign influenced behavior by altering FA treatment for burn injuries (BFAT), the need for hospital admissions, and surgical procedures are decreased.<sup>[27]</sup> In the USA, more than two-fold shorter hospital stays and less full-thickness injury were observed after community education.<sup>[28]</sup> In California, anoxic encephalopathy and death after drowning are less prevalent among children who got immediate resuscitations following the event.<sup>[29]</sup> Accordingly, reducing the lifelong disabilities, decreasing the mortality, and hospital costs are a great advantage of FA citizens training that's worth its cost.

## Methodology

A cross-sectional study was conducted in 2015 in Wazarat primary health care center. The study sample was recruited from all parents who are attending Well-Baby clinics in Wazarat health center (WHC) excluding parents who are doctors, medical students, and health care workers (who have to take obligatory the advanced trauma life support [ATLS], basic life support [BLS]). And those who don't speak and read Arabic.

Systematic sampling was conducted among all parents who fit the criteria, and every other parent was asked to participate in this study (after their consent) by filling a self-administered questionnaire that was constructed and validated by the researcher.

- A Chi-square test, generated by using SPSS, was used to assess any association between the variables. The level of significance was set at  $P$  value  $< 0.05$
- Level of awareness was categorized according to the following:
  - $< 50\% \rightarrow$  low awareness level
  - $50\% - < 75\% \rightarrow$  moderate awareness level
  - $\geq 75\% \rightarrow$  high level of awareness.

**Table 1: Parents overall first aid awareness level regarding (choking, burns, and drowning) vs sociodemographic characters n=294**

Socio-demographic	No	Knowledge						Chi-square	P
		Low (114)		Moderate (162)		High (18)			
		No	Percentage	No	Percentage	No	Percentage		
<b>Gender</b>									
Female	134	60	44.8	69	51.5	5	3.7	5.166	0.050
Male	160	54	33.8	93	58.1	13	8.1		
<b>Age group</b>									
<30	93	38	40.9	50	53.8	5	5.4	0.565	0.967
30-40	159	59	37.1	90	56.6	10	6.3		
>40	42	17	40.5	22	52.4	3	7.1		
<b>Marital Status</b>									
Married	286	111	38.8	157	54.9	18	6.3	0.589	0.745
Divorced/widow	8	3	37.5	5	62.5	0	0.0		
<b>Level of education</b>									
<High school	33	24	72.7	9	27.3	0	0.0	32.192	0.000
High school	69	34	49.3	35	50.7	0	0.0		
University and above	192	56	29.2	118	61.5	18	9.4		
<b>No of children</b>									
One	77	30	39.0	40	51.9	7	9.1	3.436	0.488
2-4	138	57	41.3	73	52.9	8	5.8		
5+	79	27	34.2	49	62.0	3	3.8		
<b>Mothers job</b>									
Working	68	22	32.4	37	54.4	9	13.2	8.259	0.016
Not working	226	92	40.7	125	55.3	9	4.0		
<b>Fathers job</b>									
Working	252	95	37.7	139	55.2	18	7.1	3.529	0.133
Not working	42	19	45.2	23	54.8	0	0.0		
<b>Family income*</b>									
<6000	31	15	48.4	16	51.6	0	0.0	21.193	0.000
6000-<12000	179	79	44.1	94	52.5	6	3.4		
>12000	84	20	23.8	52	61.9	12	14.3		

\*P value 0.00

**Table 2a: Parent’s answers regarding choking first aid for below 1 year\***

Characteristics	No (294)	Percentage
Slapping the victim on the back	229	77.9
Not encouraging the victim to cough	181	61.6
Not hanging the victim upside down by their feet	104	35.4
Not inserting a finger into the victim’s mouth looking for the toy and trying to remove it	147	50.0

\*Please revise the questionnaire in Appendix 1 regarding the scenarios

**Table 2b: Parent’s answers regarding choking first aid for >1-year child\***

Characteristics	No (294)	Percentage
Performing abdominal thrusts	199	67.7
Not asking him to take a deep breath	184	62.6
Not giving him some water to drink	132	44.9

\*Please revise the questionnaire in Appendix 1 regarding the scenarios

## Result

This study was conducted to assess the parent’s awareness regarding FA (N = 294). The response rate was 98%.

More than half of the participants (56.1%) had experienced drowning, choking or BIs before. Most of them heard about the term FA (89.5%), believed in the importance of having FA knowledge (89.1%), and knew the Saudi Red Crescent phone number (64.6%). However, only 18% had attended an FA course.

Overall, half of the parents (55%) were having a moderate awareness level regarding overall FA awareness (choking + burns + drowning) 39% have low awareness level and only 6% were having a high awareness level [Table 1]. A Significant difference was noted between mother’s and father’s awareness regarding burn, drowning & choking first aid P value ≤0.05 [See Figure 1] a significant relation was noted between overall awareness and educational level as 9.4% of responders who have university and above education have a high awareness level comparing to 0% of those who have high school and below educational level. 72.7% of those below high-school education having a low awareness level compared to 29.2% of those with university and above education; P value ≤0.05. Working mothers who have a high awareness level was 13.2% compared to 4% of housewives; P value = 0.01. 14.3% of responders with >12000 SR income have a high awareness level compared to 0% of

**Table 3: Parent’s answers regarding burn first aid**

Characteristics	No (294)	Percentage
Not placing ice on the burn area	115	39.1
Not placing honey over the affected area	161	54.8
Not applying burn ointment to the injured area	49	16.7
Lay the affected area under cool running water until the pain is relieved	126	42.9
Not Remove clothing adherent to the affected skin	148	50.3
Wrap a clean towel dampened with cool tap water around the burn area	122	41.5

**Table 4a: Parent’s answers regarding drowning first aid in not responsive but breathing victim**

Characteristics	No (294)	Percentage
Laying the victim in a left lateral position	189	64.3
Not starting a chest compression	58	19.7
Not removing victim’s clothes	202	68.7
Cover him with jacket or sweater	110	37.4
Not laying him on his back “supine position”	186	63.3
Not shaking him vigorously trying to awaken him	150	51.0

\*Please revise the questionnaire in Appendix 1 regarding the scenarios

**Table 4b: Parent’s answers regarding drowning first aid in nonresponsive not breathing victim**

Characteristics	No (294)	Percentage
Starting chest compression and mouth to mouth ventilation	266	90.5
Not performing abdominal compression to push the water out of the victim’s chest and abdomen	70	23.8
Not slapping him on the back	193	65.6
Not laying him in a left lateral position	133	45.2

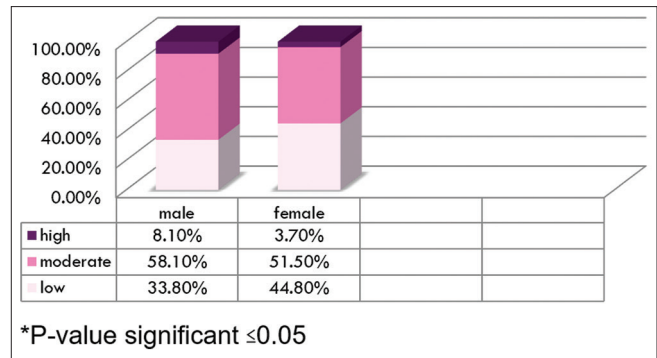
\*Please revise the questionnaire in Appendix 1 regarding the scenarios

those with <6000 SR income; *P* value = 0.00. A lot of myth and incorrect knowledge for first aid management were observed among parents answers [Tables 2a and b, 3, 4a and b].

70% of the parents think that one of the causes of deficient FA awareness is that no interest from community members and 57.8% believe that underestimation of problem size by parents is one of the causes. Fear of applying FA wrongly was the cause in 64.6% of the responses and 50% think that because it’s not obligatory in school subject and preemployment.

77.6% of the parents are willing to attend an FA course. Lack of time accounted for 65.2% of the causes behind those who are not willing to attend.

78.9% of the participants think that adding FA to school subjects is the solution for improving awareness, 53.7% prefer to read books or leaflets about FA and 68.7% see that establishing FA educational programs in PHCCs is a proper solution.



**Figure 1: Male and female overall first aid awareness regarding burn, choking and drowning n=294**

## Discussion

Most of the participants (89.1%) agreed that having FA awareness is important, their perception of FA importance may be considered as a base to build up an educational program. However, 82% of the participants did not receive any previous FA training course which is almost near to what’s reported by a cross-sectional study done in Madinah in 2019 which shows that only 34.6% of the parents had attended an FA training course,<sup>[30]</sup> in contrast to 60% in 2012 according to a Saudi study by AL Faris *et al.*<sup>[21]</sup> In addition, most of the parents didn’t even know where to attend the FA courses (64.6%) which can explain the deterioration in the frequency of having FA courses between this study and the previously mentioned one. Fortunately, most of the participants in the current study (77.6%) showed their willingness to attend an FA course, similarly, a cross-sectional study in Madinah report that 90.3% of parents show their willingness to attend FA courses if it’s held in their primary care centers.<sup>[30]</sup> These results should encourage policymakers to establish educational programs. However, a need for a wider announcement regarding FA courses by the Saudi Red Crescent Society is indicated to attract the attention of the community to its existence.

The current study showed that 94% of the participants were having low-to-moderate FA knowledge regarding choking, burn, and drowning overall, similarly in Al-Madinah’s parents, the overall level of FA knowledge for different incidents was not satisfactory (37.5%), burn and drowning were included among those incidents.<sup>[30]</sup>

Burns injuries are considered among the most devastating of all injuries and the fourth common type of trauma worldwide.<sup>[13]</sup> Unfortunately, more than half of parents (56.5%) were having low awareness and only 5.8% were having a high awareness level. As reported in a cross-sectional study in 2019, less than half of the parents have sufficient FA knowledge regarding burns.<sup>[30]</sup> There was a clear deficit in knowledge regarding not removing the adherent’s cloth to burn area as half of the participants will remove it, hearing the information from unreliable sources will lead to these wrong practices. Only 42.9% will place the



affected area under running water and 41.5% will wrap it with a clean towel damped in cool water. A study in USA showed that there is a clear defect in parents first aid knowledge regarding keeping the burn areas moist and covered, as 79% of the parents felt that drying it is better.<sup>[31]</sup> On the other hand, another study conducted in the UK to assess parents' ability to provide burn FA and showed that 73% of the parents will run the affected area underwater.<sup>[32]</sup> This huge differences may contribute to the fact that a lot of community educational program regarding FA has been held by Red Cross Society across Europe in addition to the presence of compulsory FA training at schools, at the workplace, or when applying for a driving license.

Myth and incorrect practice are prevalent in managing burns as 45.2% of the parents will place honey over the burn area and 60.9% will place ice. 83.3% will apply burn ointment to the affected area. Similarly, a systematic review done in Africa 2018 shows that 45 different substances, sometimes used in combination, are reported to have been applied to BIs: water, food items, pharmaceutical products, traditional treatments, and minerals.<sup>[33]</sup> These results agreed with a mixed-method study in Southern Malawi as well.<sup>[34]</sup> Our community still believes in traditional medicine as what most of them learned from their parents and from those around them. Every day, in our practice, we are facing many examples that cultural values and beliefs affect their health and even compliance with medications. Applying one substance or another to the burn area will increase the infection risk and interfere with the healing process.<sup>[19]</sup>

Chocking is the leading cause of unintentional injury mortality in children younger than 1 year.<sup>[8]</sup> Having the proper FA to act rapidly in such a situation is crucial. A questionnaire survey was structured in Nottingham to assess parents' knowledge and confidence with regard to infant FA. 75% of the participants knew the correct FA for chocking.<sup>[35]</sup> Unfortunately, less than half of the parents (49%) were having moderate colonization factor antigen (CFAA) and 38% having low awareness. Moreover, 64.6% of our participants would hang a chocking child upside down by the feet trying to expulse toy from his mouth, 55.1% would give water to drink to a chocking child, and 62.6% will ask chocking victim to take a deep breath. These incorrect practices not only will delay proper FA but also will harm the victim as well.

Drowning is the third leading cause of unintentional injury death.<sup>[11]</sup> Unfortunately, only half of the study participants (56.8%) have a moderate awareness level while 38.7% have a low level.

80% parents have the knowledge that CPR is effective in case of drowning but they are lacking the knowledge when to start CPR and how the FA will be different with different scenarios regarding pulse and breathing, as 80% agreed to do CPR in a patient with pulse and 76.2% of the participant will do abdominal compression to push the water out of a drowning victim who is not breathing and not responding. Only 37.4% will cover the victim. This makes hypothermia as a risk of threatening a drowning victim of great concern in our children.

Significantly, cultural aspects are guiding people's attitudes to FA. According to European Red Cross in Nordic and Anglo-Saxon countries, people are more attached to their society's welfare; resources, effort, and lives could be saved if the citizen becomes more aware that their skills and behavior after injury may affect morbidity and mortality. This can be achieved through FA educational program.<sup>[36]</sup>

This unfortunate low knowledge level could be explained by the lack of a national law that obligates all the citizens to attend FA training courses, for example, before car license or preemployment or even as a compulsory subject in Saudi schools. Additionally, this result could imply the insufficient role of the media in public education regarding these important subjects.

While lack of time was the cause in 65.2% of those who don't want to attend an FA course, this problem can be overcome by introducing FA courses to the community in many different ways so those who don't have an extra time for FA learning will take it as part of their work or school curriculums.

Finally, 78.9% of the participants think that adding FA to school subjects is the solution for improving awareness, 53.7% prefer to read books or leaflets about FA, and 68.7% see establishing FA educational programs in primary care clinics is a proper solution.

## Conclusion

This study emphasizes the need for appropriate interventions to improve the parents' knowledge regarding the FA method for common home injuries. Health care providers should take the opportunity to educate parents during their clinic and ER visit about appropriate FA actions. Additionally, FA courses or educational materials could be added as a part of the huge preventive services that are introduced to the public by primary health care in order to decrease morbidity and improve the survival rate after these injuries.

## Financial support and sponsorship

Nil.

## Conflicts of interest

There are no conflicts of interest.

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