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ASSESSMENT OF FIRST AID APPLICATIONS FOR INSECT BITES AND STINGS THAT PRESENT ON WEB PAGES ACCORDING TO THE LATEST GUIDELINES

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Abstract: *Correct action in first aid is one of the most important steps in life saving. It is natural that come face with several situations that necessitate first aid applications in daily life. One of them is bite injury also. Especially, internet is a frequently applying source about health issues. Plenty of web pages are available related to health issues and many of them have quite low reliable content. Objective of this study is to evaluate the content of web pages prepared on first aid for insect bite/sting. Terms "first aid for insect bites"," insect bites", "first aid" were searched via Google Chrome web browser in this descriptive study. Fifty web pages including first aid for bites and stings of bee, jellyfish, spider, tick and snake were investigated by researchers with using a check list improved by them. International guidelines on first aid applications were used in the formation of the check list. It has shown that the information on the web pages included in this study is limited in the context of evidence-based concept and recommendations from the latest guidelines. Traditional applications have been taking place in some of web pages. It has been shown that information about first aid for bites/stings from web pages is quite lacking and inadequate. Attention should be paid on the extent of information about first aid on the internet is that much that can be life and health threatening. Therefore, surveillance of web pages and first aid applications that require basic knowledge to be taught with interactive methods are recommended.*

Key words: *First aid, guidelines, insect bites/stings, internet, web pages*

1. Introduction

Today, internet is the first option to access information related to health issues rapidly and effectively as well as in many other issues. Internet is an important reference guide to get information on health because of internet has superiority such as to be obtained information continuously without regarding to time and place, being economic and performing thousands of web pages and posts to the user with a basic search [1,2].

According to *Pew Internet & American Life Project Health Online (2013)'s report*, 72% of internet users search subjects related to health in the United States [3, 4]. As for Turkey, *Research of*

Household Information Technologies Use (2016) by *Turkish Statistical Institute* has stated that 65.5% of daily searches on the internet are made with the aim of getting information on health [5].

It has been stated that most of the individuals that make internet search on health issues (82.5%) try to reach information typing a key word in search engine and the most used search engine (77%) is *Google* [3,6]**.** *The Guardian* (2015) has declared that every one of the 20 searches are related to the health, similarly [7].

In the consideration of the ratios, internet provides unlimited information flow to the individuals. In addition, internet provides more options for individuals to determine on health issues and makes them more effective managing their own health [8]. However, ones who gather contents of web pages, to be the information updated, accurate and the information sources are not controlled by valid scientific institutions, naturally [2,9]. Web pages that cannot meet some criteria have been guiding patients in a wrong way as well as result with severe damage [10,11]. There are reports also available on application of the incorrect information that stated in web pages by patients and resulted with death in the literature [12].

It has been specified that people applied self-medication unconsciously with first aid information they got from the internet due to the Stonefish *(Synanceia),* one of the common seen and the most poisonous fish in the world, bite toxicity in Japan. As a result, emergency room has admitted increasing number of complication, especially burns [13].

First aid which applies quickly and accurately, has positive effects on the outcome such as preventing worse conditions for the injured people and saving their life after coming face with an accident or a life threatening condition [14-16]. Therefore, individuals should apply first aid appropriately and it is understood that accurate and reliable information should be generalised.

According to *World Health Organisation* data (WHO 2007), every year 14 million insect bites and stings are seen in the world, especially in the developing countries. It was reported that 5.4 million people were bitten by snakes. 81.000 to 138.000 people of them died from poison, as three times of this number people had amputation and lived permanent disability worldwide, yearly [17]. Caliskan 2009, was reported 33 incidents were happen between the years of 2007-2008 in Canakkale even though no statistical data exists on snake and scorpion bites in Turkey [18]. According to *Turkish Minister of Health* data (2018), it has been reported that 10.562 tick bite incidents have been seen between the years of 2002-2017 and 501 (4.74%) of them have resulted with death [19].

Insect bites and stings are common all over the world and the region where the most frequently seen in is tropical regions [20]. Poisonous species of creatures such as bee, snake, jellyfish, spider, and tick are a potential threat for humans [21]. Applications for insect bites and stings that will make on injury site before hospital can affect the process in a positive or negative way [22]. It has been stated there is a positive correlation between quick access to the information when individuals needed immediate action in bite and sting cases and effective treatment. It cannot be disregarded that internet is crucial to access accurate information in such situations [23].

When web pages that have first aid for insect bites content were analysed, a Turkish study has not been found. Studies are available that evaluate information quality about treatment of meniscus tear, atopic dermatitis, back pain, and cancer on Turkish web pages [1,2,10,24].

Objective of this study is to evaluate accuracy and validity of information about first aid for bites/stings (bee, spider, jellyfish, tick, and snake) on Turkish web pages.

2. Material and Method

This research was designed as a descriptive study. Research data was collected between the dates of January-February, 2018.

First 50 web pages included in this study that have first aid applications content on frequently seen bites/stings (bee, jellyfish, spider, tick, and snake) and the search was made with "first aid for insect bites" ," insect bites", " first aid" key words in *Google Chrome* [25] search engine. Their reliability and currency were investigated by a control list including 29 items improved by researchers according to international guidelines [26-29].

The web pages were evaluated with the consideration of recommendation match between web pages and guidelines and frequency of recommendation on web pages apart from guidelines. IBM SPSS Statistics 23 package program was used for data input and analysis. Findings were given as numbers and percentages.

3. Results

It has been shown that from 50 web pages included in this research, 46% of them are institutional and 36% are personal. Any references are not specified for 18% of them. Eighty percent (80%) of the web pages evaluated had com. extension followed by; net (14%), org (4%) and gov. (2%) extension. It has been shown that 46% of web pages updated between the years of 2013-2017, 32% of them updated between the dates of 2007-2012 as for, 22% of them have no update date. It has been determined that most of the web pages weren't prepared according to current guidelines and that recommendations are traditional, not useful and not to have scientific background for some web pages.

According to findings of this study it was determined that most of the web pages did not include important points on first aid related to stings and bites. Useful information such as elevating the affected extremity (98%), washing the affected side by soap and water (88%), not using vinegar and bicarbonate (94%) were not included for bee stings. Not to use fresh water for jelly fish stings (78%) and ineffective methods such as urinating on affected area were not emphasized (100%). Valuable first aid applications for spider and tick bites and such as using cold packs; not use gasoline or any kind of oil on bitten area by tick; not to make cut on affected side after snake bites (46%) were not available on web pages. Assessment of web pages according to current guidelines has been given in table 1.

Different and some wrong recommendations on first aid applications in bites/stings are presented in table 2. It has been found that recommendations not matching guidelines such as; sucking an ice for bee stings (%31,6), washing the site with fresh water and soap and suck the bite site for jellyfish bites (%50), tightening the bite site with a cloth, scarf and tie for spider bites (55.6%), cold application for snake bites (%50), dropping oil on the tick for tick bites (%50) are available on the web pages.

Table 1. Evaluating the first aid information on web sites related to bite-and-stings according to current guidelines

Current guidelines related to first aid on bee stings	**Available n (%)**	**Not available n (%)**
To stop venom secretion, the bee's needle should be removed as soon as possible by scraping it from the edges	43 (%86)	7 (%14)
Cold application should be used to reduce pain.	41 (%82)	9 (%18)
To prevent swelling of the bite area, arm and foot hangers or lifting of the affected side can be used	1 (%2)	49 (%98)
Affected region of the body should not be moved	37 (%74)	13 (%26)
The affected area should be washed with soap and water.	6 (%12)	44 (%88)
Vinegar and bicarbonate are ineffective and should be avoided	3 (%6)	47 (%94)
Current guidelines related to first aid on jellyfish bites		
Application of sea water, baking soda, vinegar or local heat can used for deactivation of nematocysts	8 (%16)	42 (%84)
For most jellyfish, removing the tentacles and rinse in sea water is recommended. Fresh water can cause more irritation.	11 (%22)	39 (%78)
Bitten region of the body should be immersed in hot water for about 20-30 minutes until the pain is relieved.	25 (%50)	25 (%50)
Pressure bandages should not be used.	1 (%2)	49 (%98)
Any tacky stick can be picked up with fingers or scratched with a flat object like a credit card. The first aider should wear gloves.	22 (%44)	28 (%56)
The affected area should not be rubbed.	23 (%46)	27 (%54)
The affected area should not be moved.	25 (%50)	25 (% 50)
Urination on the jellyfish is ineffective and not recommended.	0 (%0)	100 (%100)

Current guidelines related to first aid on spider bites	Available n (%)	Not available n (%)
Cleaning the wound with water and a mild soap and apply antibiotic ointment.	7 (%14)	43 (%86)
Applying cold compress. Using cloth moistened with cold water or filled with ice are effective in reducing pain and swelling	11 (%22)	39 (%78)
The bitten area should be elevated if it is on the extremity.	2 (%4)	48 (%96)
Current guidelines related to first aid on snake bites		
Sucking and cutting the wound is not recommended because it is ineffective and harmful	27 (%54)	23 (%46)
Tourniquet application is not recommended because it is ineffective and can cause delay in healing	18 (%36)	32 (%64)
Injured limb should be immobilized or fixed by applying a non-elastic bandage	31 (%62)	19 (%38)
The pressure bandage is not recommended due to risk of wrong application. It may also cause to move extremity unnecessarily and cause the poison to spread.	8 (%16)	42 (%84)
Ice application is not recommended on affected side	5 (%10)	45 (%90)
Cleaning up the wound with water and a mild soap	27 (%54)	23 (%56)
Removing any jewelry or items that can cause pressure on the area near the injury (rings, bracelets, watches, etc.).	25 (%50)	25 (%50)
Current guidelines related to first aid on tick bites		
Gasoline, oil and other organic solvents should not be used to strangle the tick and avoid using matches to burn the tick.	3 (%6)	47 (%94)
To remove the tick, using a good pair of tweezers or forceps as close as possible to the skin, pulling gradually but firmly is recommended.	14 (%28)	36 (%72)
User manual should be followed if produced device is used to remove ticks	0 (%0)	100 (%100)
The bitten area should be thoroughly disinfected with alcohol or any other skin antiseptic solution.	10 (%20)	40 (%80)
Cold application can be used to reduce pain and swelling.	1 (%2)	49 (%98)

Table 2. Distribution of data containing different information than current guidelines related to first aid practices on stings and bites on Web Pages

Web pages related to first aid bee stings	n (%)	Web pages related to first aid snake bites	n (%)
Sucking an ice	18 (%31,6)	Applying Cold	16 (%30,2)
Apply ammonia-sourced water-carbonate	9 (%15,8)	Bleeding	8 (%15,1)
Applying his/her own saliva	3 (%5,3)	Applying tourniquet	8 (%15,1)
Applying dried onion itself or its' juice	3 (%5,3)	Sucking the bitten area	4 (%7,5)
Applying tourniquet on affected area	3 (%5,3)	Keeping the bitten area below the heart level	3 (%5,7)
Making the stunged area bleed	2 (%3,5)	Killing the snake and transferring it to health center	3 (%5,7)
Applying cabbage leaf's juice on the affected area	2 (%3,5)	Cauterization should not be used	2 (%3,8)
Applying lemon juice on the affected area	2 (%3,5)	Keeping the affected area higher than heart level	2 (%3,8)
Applying crushed parsley and basil on the affected area	2 (%3,5)	Mud should not be used	1 (%1,9)
Urinating on the bitten area	2 (%3,5)	Electric shock should not be used	1 (%1,9)
Rinsing mouth with salty water	1 (%1,8)	Applying mersol on the affected area	1 (%1,9)
Applying chewed tobacco on affected area	1 (%1,8)	Not trying to kill the snake.	1 (%1,9)
Dripping honey wax on affected area	1 (%1,8)		
Applying yeast	1 (%1,8)		
Keeping th affecetd limb at the heart level	1 (%1,8)		
Applying beet	1 (%1,8)		
Spreading salt	1 (%1,8)		
Applying yoghurt	1 (%1,8)		

Web pages related to first aid tick bites	n (%)
Dripping oil on it (kerosene etc.)	3 (%50)
The extracted tick is placed in a container with bleach and taken to the health center together with the patient	1 (%16,7)

Web pages related to first aid spider bites	n (%)	Web pages related to first aid jellyfish bites	n (%)
Applying,cloth,scarf or tie on affected side tightly	5 (%55,6)	Washing the affected area with soap and water	1 (%50)
Using ammonia on bitten side	1 (%11,1)	Sucking the bitten area	1 (%50)
Using the melted food which wrapped in soda and a wet cloth.	1 (%11,1)		

4. Discussion

It has been found in this study that incorrect and non-scientific information is available on Turkish web pages related to first aid for insect (bee, jellyfish, spider, snake, tick) bites. Many of people face with bites/stings and some of them fatal every year worldwide [17,19]. When first aid applications made accurately and effectively, could be life-saving. Therefore, it is important for patients/injured ones to taken accurate care before hospital. Accurate first aid applications necessitate accurate knowledge and equipment. When previous studies are investigated, it is understood that most of individuals use internet intensely to access information in every subject and one of them is health. Herewith, it is important for patients to taken accurate care before hospital. Keys of accurate care are certain and appropriate education and knowledge. As previous studies have shown, individuals use internet intensely to access information in every subject as well as health [3,4,5].

Bee stings are very common in summer times. One the most frightening results of bee stings is anaphylactic shock. The inflammation due to bee stings is related to number of stings and individual's sensitivity [30]. Sudden deaths were reported due to bee stings in studies in Turkey [31]. A study has shown that just 36% of parents possess the knowledge that the stinger should be pulled out as soon as possible [32]. It has been shown that 63.5% of primary school teachers have incorrect knowledge related to bee stings in Turkey [33]. Evidence-based first aid recommendations on the web pages for bee stings ratio is ranges between 2%-86% in this study. It has been stated that any of the recommendations such as elevation of the bee sting site to prevent swelling (98%), the importance of washing the bite site with water and soap (88%) and not to be effective of traditionally using vinegar water and bicarbonate (94%) are not available on all the web pages. First aid information for bee stings is very limited on the reviewed web pages and non-scientific recommendations are available on them (n=18). Vinegar water and bicarbonate application (15.8%), putting own saliva, essence of dried onion or lemon water that specially defined as ineffective by guidelines are recommendations that taken place on web pages. It has been thought that these applications are not useful and appropriate because they can cause infections.

Jellyfish are common worldwide and some species of them can be fatal. It can cause from mild allergic reactions to sudden cardiac arrest with regard to intense contact with nematoxin spreading from its tentacles and emptying capsule number [3,4]. Some poisonous jellyfish species exist and there is no data on injury and death related to jellyfish stings in Turkey. In addition, 40 people have been stung by jellyfish in Australia every year. It has been reported that a 6-year-old child has died due to jellyfish sting toxicity in 2007 [35]. *National Science Foundation* has reported that 20-40 of people die due to jellyfish stings yearly in the Philippines [36]. It has been revealed that 31.5% of Chinese army personnel know guidelines' recommendation to wash the bite site with sea water to deactivate nematoxin [37]. Evidence-based first aid recommendations on the web pages for jellyfish stings ratio is ranges between 0%-50% in this study. It has been stated that any recommendations such as bandage shouldn't be applied (98%), the importance of bite site should be washed with vinegar water and sea water to deactivate nematoxin (84%) and the information that not to be useful to urinate on jellyfish (100%) are not available on web pages. First aid information for jellyfish stings is very limited on the reviewed web pages and non-scientific recommendations are available on them (n=2). Recommendations that contain potential harm with infection for the patient such as nematoxin expansion will be increased by washing the site with fresh water and specially defined wash with soap (50%) and to suck the site (50%) are available on the web pages.

Spider bites are common enough in summer times, especially on August. 34.000 spider species are exist in the world as well as just a few of them are poisonous for humans. Toxicity increases with the exposure of high amount of venom and being a kid [38, 39]. 82 spider bite incidents have been reported between 1995-2004 in Turkey [40]. Mert and Bilgin (2006) have stated that people admitted to emergency room due to toxicity and 10.5% of them were spider bite incidents in Mersin [41]. First aid information for spider bites is very limited on the reviewed web pages and non-scientific recommendations are available on them (n=3). Evidence-based first aid recommendations on the web pages for spider bites ratio is ranges between 4%-22% in this study. It has been stated that any of the recommendations such as antibiotic cream application on the bite site after cleaning with water and a soap (86%), cold application to alleviate pain and swelling (78%) and elevation of the bite site to prevent swelling (96%) are not available on all web pages. First aid information for spider bites is very limited on the reviewed web pages and non-scientific recommendations are available on them (n=3). Recommendations that contain potential harm with infection for the patient such as tightening the bite site with a cloth, scarf and tie (55.6%) and ammonium and baking soda application on the bite site (11,1%) are available on the web pages.

Snake bites are important public health problems worldwide because of they have mortality and morbidity. Regarding to WHO studies, 35.000-50.000 people (most of in India) die due to snake bites yearly [42]. 550 snake bite incidents have been reported between 1995-2004 in Turkey by *National Poison Information Center* (NPIC) [40]. It has been specified that 13.6% of incidents admitted to emergency room because of animal bites and stings are snake bites by a study in Turkey 2012 [43]. In an another study, it has been stated that people prefer traditional alternative methods instead of going to hospital after snake bite which is one of the preventable death causes [44]. It should be remembered besides severe outcome as death, permanent disabilities because of amputation can occur after snake bites [17]. It has been determined that just 17% of students know accurate first aid for snake bites in a study with university students in Turkey [45]. A similar study that searched first aid recommendations for snake bites has found 54.1% of the pages include recommendations not matching with guidelines [22]. Evidence-based first aid recommendations on the web pages for snake bites ratio is ranges between 10%-62% in this study. It has been found that recommendations such as bandage shouldn't be applied (84%) because, incorrect bandage pressure can be resulted with the unnecessary movement of extremity and expansion of the poison, tourniquet application is not effective and can prolong healing time (64%), and cold application shouldn't be made at the bite site (90%) are not available on all the web pages. First aid information for snake bites is very limited on the reviewed web pages and non-scientific recommendations are available on them (n=12). Tourniquet application (15.1%) and cold application (30.2%) that specially defined as ineffective by guidelines are recommendations that taken place on web pages. Recommendations that are inconvenient and contain potential harm with infection for the patient such as to bleed the site (15.1%) and to suck the site (7.5%) are available on the web pages.

Global warming, environmental and ecological variables supply appropriate living space for ticks to increase in Turkey and all over the world. Crimean-Congo hemorrhagic fever that is a fatal condition increases as well [46]. According *to Turkish Minister of Health* 2018 data, it has been reported that 10.562 tick bite incidents have been seen between the years of 2002-2017 and 501 (4.74%) of them have resulted with death. Different studies have identified that various knowledge levels of the parents about how pull out a tick. The ratio of parents that possess accurate knowledge was found 95.8% in Tekin and Suskans' study (2010) as for, 35.8% in Singer et al. (2004) [33, 47].

Evidence-based first aid recommendations on the web pages for tick bites ratio is ranges between 0%-28% in this study. It has been stated that any of the recommendations such as cold application to alleviate pain and swelling (98%), avoided to use organic solvents such as gasoline and petroleum to suffocate the tick and using match to burn it (94%) are not available on web pages. First aid information for tick bites is very limited on the reviewed web pages and non-scientific recommendations are available on them (n=2). Dropping oil on the tick (50%) that specially defined as ineffective by guidelines is a recommendation that taken place on web pages.

Most of web pages include lacking and inadequate information on this subject. The most commonly seen incorrect knowledge about bites and stings is application of herbal or chemical agents on the site topically.

As a result, information on the internet that be used by many of people as a medical information resource needs to controlled by valid scientific institutions. These may be effective ways that people should be conscious about web pages use to prevent incorrect information results and to direct people accessing accurate information with keeping in mind that first aid information changes and updates continuously.

Limitations

This study was carried out with the most frequently used search engine "*Google Chrome"* in Turkey so that, the outcome of this study cannot be generalised all web pages.

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