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Management of and attitude of the general public toward common physical trauma events in Saudi Arabia

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ABSTRACT

Objective: This study aimed to assess the extent of public knowledge of the causes, management, and preventive measures of common physical traumas among the adult population of Jeddah, Saudi Arabia.

Methods: We distributed a questionnaire provided in both Arabic and English among all willing adults above 18 years old who were not involved in health advocating services/studies present in two malls in the northern and southern parts of Jeddah City. The questionnaire was distributed from December 2016 to November 2017. Data were collected and interpreted using an SPSS spreadsheet.

Results: In total, 911 participants were enrolled in this study; 47% (*n* = 429) were men, and 53% (*n* = 482) were women. The no-response rate among the variables ranged from 2% to 12%. The age group with the highest number enrolled was 25-34 years (38%, *n* = 348). The majority of participants were employed (56%, *n* = 489), and up to 95% (*n* = 864) agreed on the importance of trauma education. Almost half of the participants (*n* = 415) had never heard of the tetanus vaccine, and only 18% (*n* = 168) had a cut that required medical attention. Pouring water on the wound and applying pressure were the main actions taken in case of bleeding from an injury (33%, *n* = 301). About 30% (*n* = 270) of the participants suffered from bone fractures, the main cause of which was falling (44%). Almost half of the participants (43%, *n* = 391) agreed that children and elderly individuals were the most prone to bone fractures from falls. Of the 359 participants with a history of traffic accidents, 44% were passengers. 21% (*n* = 188) of the participants had burns that required medical attention; hot water was the dominant cause (53%).

Conclusion: Public awareness and guided planning for situational hazards and early reporting are crucial and part of our responsibility as healthcare advocates regardless of gender, age group, or educational level. In this study, the majority of participants agreed on the importance of trauma management education.

Keywords: Trauma, injuries, public awareness, public education.

Introduction

"Physical trauma" is a general term used to describe serious injuries to the body. Often, they are categorized into two main types: blunt force and penetrating trauma. Physical trauma is considered a leading cause of death worldwide, specifically in low- and middle-income countries. A study conducted in 1988 reported that women had a 25% higher fatality risk than men [1]. In both sexes, the lowest fatality risk was observed in individuals aged 20 years old (ibid).

Traffic accidents are a dominant cause of trauma. In 2014, the World Health Organization estimated that 5.8 million individuals die annually from traffic accidents [2]. Consistent with this finding, in Saudi Arabia, a retrospective study conducted in Riyadh between 2001

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and 2010 demonstrated that motor vehicle collisions were the most common cause of injuries [3]. Similarly, the World Health Organization estimated a total of 9,311 motor vehicle accidents in Saudi Arabia in 2016 alone [4]. The related mortality rate was 28.8 deaths per 100,000, which is higher than the average rate in countries of parallel income groups (ibid).

As the Saudi population continues to grow, the healthcare burden increases, particularly in the trauma sector [2]. There are approximately 193 general hospitals and 56 specialized hospitals nationwide; however, tertiary centers with trauma responses are generally only found in larger cities, and only two hospitals across the entire country have a trauma registry [2].

Several preventative measures have been implemented by the government of Saudi Arabia to reduce the rate of traffic accidents. For instance, a camera ticketing system was applied in 2010 to control speed and monitor seatbelt and mobile phone usage violations. Since then, significant improvements in health outcomes and injury severity scores, such as the Glasgow Coma Scale, have been observed [5]. Another common cause of trauma that presents in a wide range of severities and can potentiate both physical and psychological consequences is burns. Burns are classified into three well-known categories: first-, second-, and third-degree. As with traffic accidents, low- and middle-income countries have higher incidence and mortality rates related to burns [6]. In a recent review documenting the epidemiology of burns in Saudi Arabia, young children represented 52% of burn victims (ibid). Moreover, men showed a higher incidence of burns than women (ibid). Other common causes of trauma include pedestrian injuries, falls, burns, bone fractures, stabs, and gunshot wounds.

Once serious physical trauma has occurred, immediate medical attention is vital to provide the best level of care. In Saudi Arabia, there is still room for improvement in this area; currently, major trauma cases are transported to the nearest largest hospital, regardless of distance, with no other clear pre-hospital transportation guidelines or trauma triage protocol [2]. As such, educating the general public on an appropriate immediate management approach can be crucial in preventing fatalities, and it is important to measure the depth of the public's knowledge regarding this topic. This study aimed to assess the extent of public knowledge of the causes, management, and preventive measures for common physical traumas among the adult population of Jeddah, Saudi Arabia.

A descriptive cross-sectional study was conducted using a self-administered questionnaire. The questionnaire was distributed in two of the most popular shopping centers in Jeddah City: the Red Sea Mall and Al Andalus Mall in the south and north of Jeddah, respectively. It was made available in both Arabic and English and utilized simple jargon. No personal data, such as name or contact information, were required from any participant. The study excluded participants under the age of 18 years, those who did not understand Arabic or English, or any health care providers. The questionnaires were completed under the distributors' supervision and handled on-site. Data were piloted and validated. Simple descriptive statistics were produced using SPSS software (version 21.0; SPSS, Inc., Chicago, IL). The chi-square test was used to compare the incidence between the two interventions, and statistical significance was set at $p < 0.05$. The results were recorded as *p*-values, percentages, medians, and interquartile ranges.

A total of 911 participants met the inclusion criteria and were enrolled in this study, 47% ($n = 429$) of whom were men. The no-response rate among the variables ranged from 2% to 12%. The age group with the highest number enrolled in this study was 25-34 years, representing 38% ($n = 348$) of the total sample. The majority of participants were employed (56%, $n = 489$), and up to 95% ($n = 864$) agreed on the importance of trauma education. Table 1 shows the demographic data of the enrolled participants. Almost half ($n = 415$) had never heard of the tetanus vaccine, and only 18% ($n = 168$) had a cut that required medical attention. Pouring water on the wound and applying pressure were the most common actions in the case of bleeding from an injury (33%, $n = 301$). Table 2 illustrates the participants' responses to the questions on cuts and bleeding. When asked how the participant would respond to a bleeding injury, 14% said they would put coffee beans on the bleeding site and apply pressure, 24% would clear the wound with water and then bandage, 33% would pour water and apply pressure at the same time,

Table 1. *Descriptive statistics for sociodemographic and traumatic events education variables among the participants.*

Variables	Total number of participants ($n = 911$)
Gender	
Males	429 (47)
Females	482 (53)
Age group in years	
(18-24)	331 (36)
(25-34)	348 (38)
(35-44)	150(16)
(45-55)	62 (7)
(>55)	20 (2)
Education level	
Intermediate school	79 (9)
Secondary school	290 (32)
College/Postgraduate degree	526 (58)
NR[a]	16 (2)
Employment	
Student	222 (24)
Employed	489 (54)
Unemployed	200 (22)
Kids at home	389 (43)
• Do you think society education about trauma is important?	864 (95)
Why? Because:	
It is an everyday issue	$n = 864$
To prevent complications	67 (8)
To reduce mortality	48 (6)
To know how to protect ourselves and our children	38 (4)
	153 (18)
All of the above	543 (63)
NR	15 (2)
Preferred education method	$n = 864$
Lectures	162 (19)
Videos	308 (36)
Campaigns	222 (26)
Workshops	139 (16)
Social media	8 (1)
NR	25 (3)

Table 2. *Participants' response to cuts and bleeding questions.*

Variables	Total number of participants (*n* = 911)
Have you ever had a cut that required medical attention? (%)	168 (18)
You started to bleed after an injury, your action is (%)	
Put coffee bean on the bleeding site and then pressure	123 (14)
Clear the wound with water and then bandage	222 (24)
Pour water on the wound and apply pressure at the same time	301 (33)
Go to the emergency department	230 (25)
Do nothing	32 (4)
Put some honey on the wound	2 (0)
You suffered from a cut injury, your action is (%)	
Put some honey on the cut site	86 (9)
Put some toothpaste on the cut site	32 (4)
Leave it as it is; will heal on its own	79 (9)
Cover it with clear gauze only	332 (36)
Go to the emergency department	348 (38)
NR[a]	34 (4)
Have you ever received the tetanus vaccine? (%)	
Yes	122 (13)
Never heard of it	415 (46)

25% would go to the emergency department directly, 4% would do nothing, and two would apply honey to the wound. Moreover, in response to a cut injury, 9% would apply honey, 4% would smear toothpaste on the cut site, 9% would do nothing and expect it to heal on its own, 36% said they would cover it with clear gauze, and 38% said they would go to the emergency department. In contrast, if a burn had occurred, 23% said they would apply honey, 17% would apply toothpaste, another 23% would poor cold water, and 33% would apply topical medication and cover with gauze; however, 4% said they would do nothing, and only 1% would go to the emergency department.

Table 3 shows participants' responses regarding bone fractures, falls, traffic accidents, and burn-related questions. About 30% (n = 270) of the participants suffered from bone fractures, the main cause of which was falling (44%). Approximately half of the participants (43%, n = 391) agreed that children and elderly individuals were the most prone to bone fractures from falls. Furthermore, 359 participants reported a history of traffic accidents, 44% of which were passengers. When asked about burns, 21% (n = 188) of the participants had burns that required medical attention; hot water was the dominant cause (53%). The differences between women and men with regard to multiple variables are listed in Table 4 with the corresponding p-values.

The worldwide prevalence of physical trauma is widely acknowledged. 39% of our participants reported being involved in traffic accidents. This aligns with previous studies that highlighted the high prevalence of motor vehicle collisions. Between 1984 and 1989, traffic accidents represented 83.4% of all trauma admissions with uncontrolled speeding accounting for the majority of these cases [7]. In line with the World Health Organization, a recent epidemiological review on burns in Saudi Arabia suggested that most burns occur within homes, among children, and via hot fluids [6]. Hot water

Table 3. *Participants' response to bone fractures, falls, road traffic accidents, and burns-related questions.*

Variables	Total number of participants (*n* = 911)
• History of bone fracture (%)	270 (30)
What caused it? (%)	*n* = 270
Fall	120 (44)
Road traffic accident	36 (13)
Have been attacked	10 (4)
Use of heavy objects	18 (7)
Sports	82 (30)
NR[a]	5 (2)
I know I have bone fracture because of: (%)	
Pain and swelling at the injury site	240 (26)
Skin color change at the injury site	22 (2)
Inability to move my limb (hand or feet)	93 (10)
Inability to walk on my feet	21 (2)
All of the above	425 (47)
I do not know	110 (12)
You doubt you have a bone fracture; what would you do? (%)	
Go to the emergency department	762 (84)
Use pain killers	39 (4)
Use topical muscle relaxant	29 (3)
Cover it only with gauze	41 (5)
Nothing	11 (1)
NR	29 (3)
• Any serious injuries from falls? (%)	255 (25)
What injury is caused by falling? (%)	
Head injury	*n* = 255
Wound/bruises	53 (24)
Burns	48 (21)
Musculoskeletal injury (bone fracture, displacement, etc.)	6 (3)
	81 (36)
Internal bleeding	9 (4)
NR	28 (12)
An individual has fallen in front of you, your action is (%)	
Call 997	240 (26)
Go talk to him; make sure he is okay	245 (27)
Measure his vital signs	26 (3)
All of the above	366 (40)
Do nothing	34 (4)
Which age group do you think is more prone to bone fractures from falls? (%)	
Elderly	141 (16)
Children	148 (16)
Children and elderly	391 (43)
All age groups	182 (20)
I do not know	49 (5)
• Have you ever been involved in a road traffic accident? (%)	359 (39)
What was your role?	*n* = 359
Pedestrian	32 (9)
Driver	156 (44)
Passenger	170 (47)
Have you been injured?	*n* = 359
No	166 (46)
Yes, light wounds/bruises	86 (24)
Yes, deep wounds	22 (6)
Yes, lost consciousness	16 (5)
Yes, fractured bones	37 (10)
Yes, just burns	4 (1)
Have you lost someone because of road traffic accidents?	411 (45)
• Have you ever got burns that required medical attention? (%)	188 (21)
What caused the burn?	*n* = 188
Chemicals	7 (4)
Fire	49 (26)
Sun burn	9 (5)
Hot water	100 (53)
Hot oil	5 (3)
Hot object	7 (4)
NR	11 (6)

Continued

Variables	Total number of participants (*n* = 911)
You got a burn, your action is	
Put some honey on the burn site	209 (23)
Put some toothpaste on the burn site	153 (17)
Pour cold water on the burn site	206 (23)
Use a topical medication and then cover it with gauze	296 (33)
Nothing	34 (4)
Go to the emergency department	13 (1)

was consistently the dominant cause of burns in this study. Furthermore, 21% of respondents reported experiencing burns that required medical attention. Because burns are most likely to occur within households, it is important to ensure that individuals have the capacity and correct information to apply the appropriate immediate response. As shown in Table 3, many misconceptions and inappropriate actions are followed by the general public in response to burns. This reflects limited access to basic first aid education. Rather than only examining the incidence of physical trauma, the purpose of this study was to measure the general public's knowledge and first-aid skills regarding physical trauma. In addition to burns, the responses to our survey show the general public's inadequate awareness of the appropriate response to cut and bleeding wounds.

Furthermore, the results of our study revealed that men were significantly more likely to do nothing in emergency situations, such as burns and bleeding injuries. These results suggest that gender can influence healthcare-seeking behavior and are consistent with a number of other studies. A study conducted in Canada in 2013 revealed that women visited their primary healthcare providers at a greater frequency than men [8]. Although no definite explanation can be reached, this could be attributed to the prevalent "macho" masculinity complex in which it is considered a weakness to seek help. In a recent paper, Novak et al. [9] drew attention to how masculine gender norms may act as a barrier to healthcare seeking, specifically among religious heterosexual men. A significantly higher prevalence of serious injuries from falls was observed in men than in women. Men may be more inclined to expose themselves to high-risk behaviors, which could result in more fatal

Table 4. *The difference between males and females.*

Variables	Participants who had poisoning in the past (*n* = 911)		*p*-value‡
	Female (*n* = 380)	Male (*n* = 301)	
Age group in years (%)			
(18-24)	194 (40)	137 (32)	0.034
(25-34)	164 (34)	184 (43)	
(35-44)	76 (16)	74 (17)	
(45-55)	36 (8)	26 (6)	
(>55)	12 (3)	8 (2)	
Receiving tetanus vaccine (%)			
Yes	65 (14)	57 (13)	0.211
Never heard of it	207 (43)	208 (49)	
You started to bleed after an injury, your action is (%)			
Put coffee bean on the bleeding site and then pressure	67 (14)	56 (13)	<0.001
Clear the wound with water and then bandage	118 (25)	104 (24)	
Pour water on the wound and apply pressure at the same time	188 (39)	113 (26)	
Go to the emergency department	96 (18)	134 (31)	
Do nothing	10 (2)	22 (5)	
Put some honey on the wound	2 (0)	0	
I know I have bone fracture because of: (%)			
Pain and swelling at the injury site	123 (26)	124 (29)	0.228
Skin color change at the injury site	15 (3)	13 (3)	
Inability to move my limb (hand or feet)	53 (11)	43 (10)	
Inability to walk on my feet	8 (2)	16 (4)	
All of the above	239 (50)	188 (44)	
I do not know	44 (9)	45 (11)	
Have you ever got burns that required medical attention? (%)	133 (23)	82 (19)	0.065
You got a burn, your action is (%)			
Put some honey on the burn site	133 (28)	76 (18)	<0.001
Put some toothpaste on the burn site	66 (14)	87 (20)	
Pour cold water on the burn site	112 (23)	94 (22)	
Use a topical medication and then cover it with gauze	157 (33)	139 (32)	
Nothing	9 (2)	25 (6)	
Go to the emergency department	5 (1)	8 (2)	
Any serious injuries from falls? (%)	102 (21)	128 (30)	0.003
Which age group do you think is more prone to bone fractures from falls? (%)			
Elderly	69 (14)	76 (18)	0.002
Children	70 (15)	80 (19)	
Children and elderly	232 (48)	163 (38)	
All age groups	102(21)	87 (20)	
I do not know	9 (2)	23 (5)	

‡ Using chi-square with a 95% confidence interval.

falls. Similarly, the World Health Organization states that, although both genders have fall risks worldwide, women are more likely to experience non-fatal falls while men are more likely to die from a fall [10].

A previous study conducted in 2021 also investigated public awareness of the appropriate response to cervical spinal injuries [11]. Less than one in three participants was aware of cervical spine trauma or a suitable first-aid response. Their results align with those of this study, which demonstrated the general public's lack of knowledge on the appropriate management of burns, bleeds, or cuts.

A recent study conducted in 2020 aimed to assess the level of awareness of healthcare workers, specifically regarding burn management in Saudi Arabia. The study yielded a large sample size of 1,438 participants, the majority of whom exhibited poor knowledge of the correct first-aid response to burn injuries. Specifically, 82% of the respondents agreed that the use of antibiotics was beneficial in burns, which is untrue [12]. While this study provided insight into the knowledge of healthcare workers, it investigated a population with a less medical background, the general public.

This study had several strengths. For example, the questionnaire was distributed in both English and Arabic, making it inclusive of a wider demographic. As a result, the questionnaire received a high response rate, favorably affecting the reliability of the sample. In addition, clear selection criteria were outlined. Furthermore, this study provides novel insights into the public's perception and awareness of the incidence of physical trauma. Gaining a better understanding of the prevalent misconceptions in our society can aid in the development of an efficient strategy to combat them.

Despite its strengths, this study had several limitations. Owing to the descriptive and cross-sectional nature of this study, a causal relationship could not be confirmed. However, the selected study method (questionnaire) remains ideal for obtaining data on individuals' attitudes, perceptions, and experiences. Additionally, this study was entirely dependent on self-reported measures, creating a potential for recall bias.

Acute physical trauma is a major health concern in our community as it has a very high prevalence. Moreover, in some cases, the gap in awareness and knowledge may exacerbate negative consequences due to common misconceptions and poor initial management practices by the individual. Public awareness and guided planning for situational hazards and early reporting are crucial and are part of our responsibility as healthcare advocates regardless of gender, age group, or educational level. In this study, the majority of participants agreed on the importance of trauma management education.

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Conflict of interest

The authors declare that there is no conflict of interest regarding the publication of this article.

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Consent to participate

Written consent was obtained from all the participants.

Ethical approval

Ethical approval was granted by Institutional Review Board at King Abdullah Internationa Medical Research Center (KAIMRC) via reference IRBC/1020/17 13th August 2017.

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