

Community Knowledge and Attitude about Burns First Aid (BFA) in Jazan, Saudi Arabia

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How to cite this paper: Hoque, Md.M., Moukhyer, M.E., Khamjan, N.A., Siddig, B.A., Maguen, E., Alam, S., Hakami, A.I.A., Mobarki, S.Y.M., Ghazwani, B.H.S., Alhathiq, A.A., Hassan, L.E. and Mukhayer, A. (2024) Community Knowledge and Attitude about Burns First Aid (BFA) in Jazan, Saudi Arabia. *Journal of Biosciences and Medicines*, 12, 135-148.
<https://doi.org/10.4236/jbm.2024.124012>

Received: March 5, 2024

Accepted: April 12, 2024

Published: April 15, 2024

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Abstract

Introduction and Significance: Burn injury (BI) is a considerable health issue which is responsible for around 300,000 deaths and affecting about 11 million people every year worldwide. In Saudi Arabia, the prevalence of BIs array from 112 to 518 per 100,000 per year. The appropriate awareness of performing first aid could facilitate to improve the outcomes of burns. **Purpose and Objectives:** To appraise the community that acknowledges burns, first aid, and associated factors among the community population in Jazan City, Saudi Arabia. The paper aims to identify limitations to encourage additional research and persuade legislators to develop improved burn-injury care recommendations and training programs. **Materials and Methods:** An observational-based sample survey was conducted among the people who live in Jazan City aging 13 years or more, during April 5 to May 5, 2023. Data collection was done by a validated online self-administrated questionnaire sent randomly to community members in different parts of Jazan City via social media platforms. Collected data were coded and cleaned by an excel program, and finally exported on SPSS 26.0 software. The variables were analyzed using descriptive statistics like frequencies and percentages. Also, the Chi-square test was used to investigate the relation between different variables, with a significance value of $P < 0.05$. The ethical approval was taken from the scientific research ethics committee, at Jazan University. **Results:** This study included 243 participants (about 62%) among them were mostly male participants (151) having a university degree. The majority of participants 75% did

not take any form of BFA training in the past. This study shows that 69.9% of the participants have inadequate awareness, despite 72% having a constructive attitude towards burn first aid. Previous burn-related first aid training was significantly associated with participants' knowledge of BFA at a p-value less than 0.05. **Conclusion:** This study indicates a high frequency of Jazan population having inadequate knowledge of burn first aid despite the high prevalence of a favorable attitude. There is a need to develop an effective nationwide burn prevention program and early burn first aid treatment in Saudi Arabia and promote a consistent guideline for burn first aid.

Keywords

Burn Injury (BI), Burns First Aid Knowledge, First Aid Training, Jazan City

1. Introduction

Burn injuries are a continuous and considerable public health problem which is the fourth most common type of trauma worldwide [1]. Burn-related injuries occur when hot liquids, solids, or a flame rupture one or more of the skin's layers. Also, "burn" is a term describing skin damage by chemicals, electricity, or radiation [2]. These injuries are a major cause of mortality and morbidity in developing countries, affecting about 11 million people worldwide with an estimated 300,000 deaths every year and contributing to morbidities like an increase in hospital stays and development of disability afterward [3]. In Saudi Arabia, burns remain a major source of injury with a prevalence of 112 to 518 per 100,000 per year particularly among young children, in whom the major mechanism of injury appears to be scalding from hot liquids [4]. Initial early management, which involves first aid measures at the scene of the burn accident before access to a hospital, and before transfer to a burns center, is a highly important step in burn management [5].

Proper and simple initial treatment when correctly applied has the potential to reduce injury depth, pain, and post-burn complications [6]. Studies have shown that appropriate first-aid interventions reduce morbidity-related costs and tissue effects, resulting in a lower need for surgical procedures [7]. Performing first aid, stopping the burn process, and taking immediate measures like running cold tap water for at least 10 - 15 min, removing clothing and jewelry, and dressing the wound with a sterile dressing will help improve the outcomes of burns [6]. In contrast, some individuals have been utilizing a variety of topical remedies such as ice, herbal medicines, oil, honey, vinegar, flour, toothpaste, and eggs to treat burn injuries without any scientific proof [8]. Giving such odd remedies worsens the wound and encourages bacterial development, increasing the post-burn consequences [9]. So, people must have an appropriate level of knowledge for the first aid management of burn injuries to save themselves and to help others. However, inadequate public education regarding burn first aid (BFA), injury

prevention, and control methods and a lack of resources in underfunded health facilities contribute to the observed poor results.

In recent years, widespread attempts to reduce the risk of burns by increasing public awareness and encouraging individuals to undertake steps like installing and maintaining fire alarms and lowering the heat of water in the home has led to an apparent decrease in burn incidence and mortality, especially in more developed countries [8]. In addition, the prompt and effective application of BFA has been shown to positively impact the burn outcome, preventing further tissue damage and reducing subsequent morbidity [10]. It was observed in a recent cohort study that 20 min of running water received as first aid had improved outcomes by about 58.1%. This intervention was associated with a statistically significant reduction in burn wound depth, faster healing (by 10%), and less need for skin grafting. Furthermore, patients who did not receive appropriate first aid had a higher complication rate (35.3% vs. 18.4%) compared with patients who received [11]. Gete *et al.* [12] reported in a cross-sectional study that 66.2% of respondents had poor knowledge of proper BFA. The majority (80.7%) of respondents did not take any form of BFA training. Females were almost four (4) times more likely to have good knowledge as compared to males. Also, there was a significant correlation with knowledge as seen in participants living in rural areas were almost 61% less likely to have good knowledge of BFA as compared to those living in urban areas. A significant number of participants 79 (25.9%) were still using traditional home remedies as a BFA, which has no scientific value. Wallace *et al.* [13] in their study showed that older males (≥ 65 years) age groups had relatively lower levels of BFA awareness. Also, most participants who did not take part in any training courses for BFA had significant limitations of awareness, of them, only 15% had sufficient knowledge and only 9.4% knew the practice in cooling the burn wound surface. In summary, BFA training has played an important role in the past five (5) years which increased the knowledge. Graham *et al.* [14], in their study done in Southern Yorkshire, Britain found that around 73% of mothers used cooling methods on the burn wound, approximately 92% of parents applied cover to the burn wound with appropriate materials while less than 40% parents remove clothing and jewelry and 35% applied water in sufficient time. Harvey *et al.* [15] found in their study conducted in New South Wales that most respondents (82%) would cool a burn with water, but only 9% knew the recommended 20 minutes. Few respondents reported that they would remove the patient's clothing and keep the injured person warm. First aid books (42%) and the internet (33%) were the most common sources of first aid information. Those over 65 years had insufficient first-aid knowledge. Cross-sectional study conducted in KSA in 2020 found that the knowledge level is not enough regarding first aid for burn patients along with the healthcare professionals. Participation in a previous burn training course was much linked to improvement in information regarding knowledge across groups of different genders, ages, and races ($P < 0.001$) [16]. A recent cross-sectional survey conducted in Jeddah; KSA, in July 2022 showed that the majority of participants

(52.7%) had an excellent level of knowledge about BFA. A common misconception was to pick blisters (46.8%) which is an incorrect action. Interestingly, the oldest age group (>50 years) was shown to have considerably higher knowledge scores ($P = 0.0001$) which were in contradiction to other studies [17].

The most important step in burn injury management that significantly affects morbidity and mortality is in the first hour after its occurrence, thus, being aware of the appropriate management for such factors plays a crucial role in a patient's life [18]. Regarding Saudi Arabia, it was found that there is a lack of knowledge and practice of burn first aid in many regions [19]. Yet, there is no prior study conducted in Jazan that investigates first-aid burn perception and awareness. However, the broad objective of this study includes the evaluation of the community knowledge and attitude about BFA in Jazan City, Kingdom of Saudi Arabia with a specific target to determine the prevalence of adequate and inadequate BFA knowledge among the Jazan population. Also, find the association between BFA knowledge and different sociodemographic variables and previous BFA training. In addition, identify limitations to encourage additional research and persuade legislators to develop improved burn-injury care recommendations.

How is this paper divided?

2. Methodology

The study was designed as a cross-sectional survey using an online set of questions distributed from April 5 to May 5, 2023, in Jazan City, KSA which covers an area of 40,000 km². And one of the most densely populated cities in the KSA. The process of data collection was done with a self-administrated set of questions hosted on the Google survey web page, and the link was sent randomly to community members in different parts of Jazan City via WhatsApp and other social media platforms. All participants were informed about the study requirements, ethically approved by the scientific research ethics committee at Jazan University. All participants who are 13 years of age and above, living in Jazan City, and those who agreed to participate were enrolled.

The sample size for this study was calculated using Cochran's formula ($n = \frac{Z^2 pq}{d^2}$), Since there is no previous similar study in Jazan City is available, we calculated our sample size based on the assumption that 50% ($P = 50\%$) of community population have adequate knowledge, with a 95% confidence interval and 5% margin of error. Z with a 95% CI = 1.96. $P = 50\% = 0.5$, $q = (1 - p) = 0.5$, $d = 0.05$. $\rightarrow (1.96)^2 (0.5) (0.5) / (0.05)^2 = 384$ persons.

So, the target sample size is 384. However, only 243 participants provided valid questionnaires leading to a response ratio of 63.3% considered acceptable for this study.

Data collection was done using an online pre-assessment, a structured self-administered survey consisting of 23 questions, adopted and modified from similar previous studies. The survey consisted of the following sections: **So-**

socio-demographic information: Composed of five questions about age, gender, education, occupation, and if living with children in the same house. Two additional questions were about the previous experience with burn injuries and prior burn first aid training. **Knowledge:** Composed of 12 multiple-response close-ended questions with the answer options as agree, disagree, do not know, such as the first correct step in first aid of burns management, covering the burn area, etc. The last section contains five questions to assess **attitude**.

The questions that need to be answered in this study include what are the different levels of burns first aid knowledge among community members in Jazan, and what are the associated factors that affect it? Is there a relation between prior BFA training and knowledge?

Knowledge Assessment: Each question out of 12 had only one correct answer scored as 1, while incorrect answers and “do not know” were scored as 0. A total score out of 12 was used to calculate the percentage. Scores were graded as adequate if ($\geq 70\%$) and inadequate if ($\leq 70\%$). **Attitude Assessment:** Determined as favorable or unfavorable based on responses to the five questions assessing the fire prevention and control practices and opinions. The same scoring system used in knowledge was used.

Statistical Analysis

Hejase *et al.* [20] contend that informed objective decisions are based on facts and numbers, real, realistic, and timely information. Furthermore, according to Hejase and Hejase [21], “descriptive statistics deals with describing a collection of data by condensing the amounts of data into simple representative numerical quantities or plots that can provide a better understanding of the collected data” (p. 272). The data entry and analysis were performed using the IBM Statistical Product and Service Solutions software package SPSS version 26.0 [21]. Data were described using frequencies and percentages. The mean and median were calculated for the knowledge score. The chi-square test was used to find out the association of sociodemographic variables with the level of knowledge about burns prevention and first aid. All associations were considered significant at $P < 0.05$.

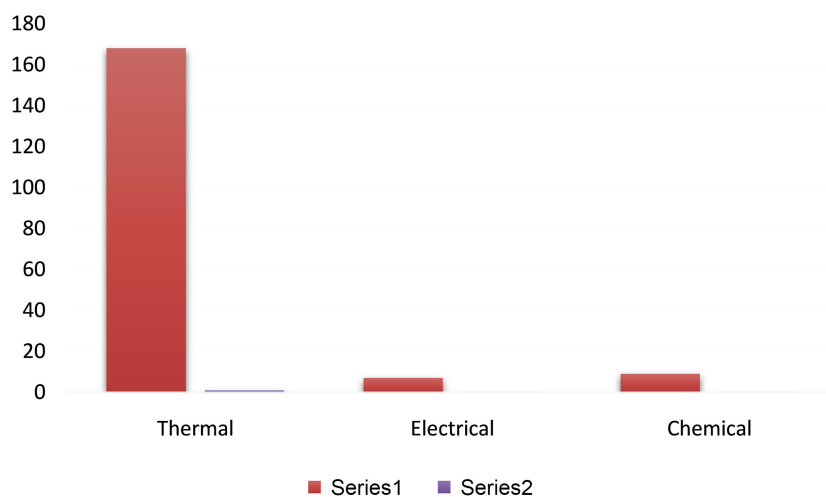
3. Results

This study included a total of 243 participants. 139 (57%) of them were in the age range of 25 - <65 years. 149 (62%) of them were males, while 93 (38%) were females. By education status, most participants 151 (62%) have a university degree and above. The baseline characteristics of patients are shown in **Table 1**. Regarding burn experience, nearly three quarters (72%) had a previous burn injury, and most of them were thermal (168) **Figure 1**. The majority of participants 75% did not take any form of BFA training in the past.

Regarding the BFA knowledge of participants, 13 knowledge-based questions were asked. The first of which was to state if a burn can lead to permanent injuries

Table 1. The base line characteristics of participants.

Criteria	Category	Frequency	Percentage (%)
Age	<15 years	5	2.10%
	16 - <25 Years	98	40.30%
	25 - <65 years	139	57.20%
	>65 years	1	0.40%
Gender	Male	149	62%
	Female	94	38%
Educational statuses	Mid/Sec School	60	25%
	Diploma	29	12%
	University	151	62%
	No formal education	3	1%
Occupation	Healthcare worker	70	29%
	Non-Healthcare	67	27%
	Unemployed	108	44%
Are there children/teenagers (under 18 years) living at home with you?	Yes	202	83%
	No	41	17%
Have you had any experience of burn to self or a member of your family?	Yes	177	73%
	No	66	27%
What was the cause of burn injury?	Thermal	168	91%
	Electrical	7	4%
	Chemical	9	5%
Have you ever participated in a previous burns first aid training?	Yes	60	25%
	No	183	75%

**Figure 1.** Types of previous burn injuries.

and mental disorders. 198 (82%) participants answered positively to this question. In the second question, about (106) 44% do not know the right step in case

of burn injuries, which is washing the burned area with room temperature water. However, when participants were asked about the duration of washing, only 14 (8%) said they would wash for >15 minutes. Subsequently, they were asked about covering burned area with a clean cloth before heading to the hospital which can decrease the risk of infection, about (60%) answered correctly of which about 84% knew what to use to cover the burned area, denoting to clean cloth. When asked about what home traditional medication is used to apply for burn injuries, almost half of the participants (54%) answered that they would not apply anything to the burned area. 68 (28%) of responders said that toothpaste could be used. Participants' answers to other questions are shown in **Table 2**.

Table 2. Participants response to Burns First Aid knowledge questions.

Questions	Response	Frequency	N%
Burns can lead to permanent injury and mental disorder	Agree	198	81.80%
	Disagree	11	4.50%
	Don't know	33	13.60%
Washing the burnt area with cool water is the first right step in case of burn injuries	Agree	136	56.20%
	Disagree	59	24.40%
	Don't know	47	19.40%
If you agree, apply water for	>15 minutes	14	8.60%
	1 - 3 minutes	85	52.50%
	5 minutes	29	17.90%
	10 - 15 minutes	34	21.00%
In case of burn injury, covering the burnt area before heading to the hospital can decrease the risk of infection	Agree	147	60.70%
	Disagree	58	24.00%
	Don't know	37	15.30%
If you agree, what would you cover the burn with?	Clean cloth	148	84.10%
	Cling film	11	6.30%
	Other	17	9.70%
If someone catches fire and is in flames, wrap the person in thick materials such as wool or cotton coat, rug or blanket	Agree	183	76.30%
	Disagree	25	10.40%
	Don't know	32	13.30%
In case of burn injury, which one out of the following traditional medication will you consider applying?	None	133	55.40%
	Toothpaste	68	28.30%
	Dough	22	9.20%
	Oil	14	5.80%
	Coffee powder	3	1.30%

Continued

How does one extinguish a pot of oil that has caught fire?	Cover with cloth	145	60.40%
	Throw water on it	15	6.30%
	Move it to a safe place	80	33.30%
	Don't know	0	0.00%
In case you catch flame burns, stop, drop and roll. Do not run	Agree	186	77.50%
	Disagree	11	4.60%
	Don't know	43	17.90%
Always seek medical help if the size of the burn is larger than 2 - 3 cm and skin is burnt through	Agree	213	88.80%
	Disagree	8	3.30%
	Don't know	19	7.90%
If there are large areas or very deep burns, give water or milk by mouth	Agree	56	23.50%
	Disagree	56	23.50%
	Don't know	126	52.90%
In case of burn injuries, picking blisters is an incorrect step	Agree	151	63.20%
	Disagree	34	14.20%
	Don't know	54	22.60%
Applying first aid medicine at home on a burnt area leads to a better outcome	Agree	213	87.70%
	Disagree	12	4.90%
	Don't know	18	7.40%

Then the overall mean score of participants' knowledge was 0.60. More than two-thirds (70%) of participants were found to have inadequate knowledge about burn first aid (**Figure 2**).

Regarding participants' attitudes towards BFA, four questions were asked. Only 84 (35%) agreed that applying dough, oil, mud, toothpaste, etc. on the wound delays the healing process. In addition, a significant portion (42%) think that applying traditional remedies is good for burn care before going to the health facility. The majority of the participants (98%), thought that they should learn burns first aid. Almost all participants (99%) mentioned that burn first aid is a basic skill that everyone must know. **Table 3**. The majority 177 (72%) of the responders, were found to have a favorable attitude toward BFA, **Figure 3**.

Regarding Factors associated with BFA knowledge, adequate knowledge was observed in 30.1%, of which 19% were males, and the rest 11.1% were females. A chi-square test showed no statistical significance between gender ($X^2 = 8.29$, 9 d.f., $P = 0.5$), occupation, living with children at home, and previous burn injury experience. Age was significantly associated with knowledge, in contrast, old-age participants were shown to have more adequate knowledge than younger ones. Regarding education status, participants with a university degree showed more adequate knowledge. A statistically significant association was found between education and knowledge, education level and previous BFA training were statistically significantly associated with knowledge level.

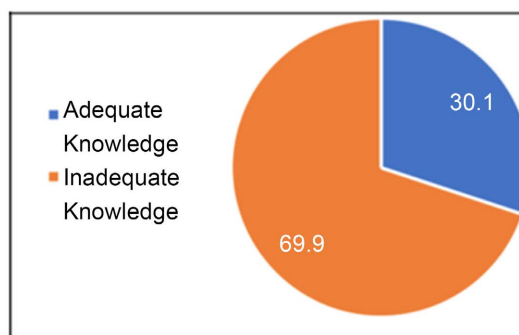


Figure 2. Participants burn first aid.

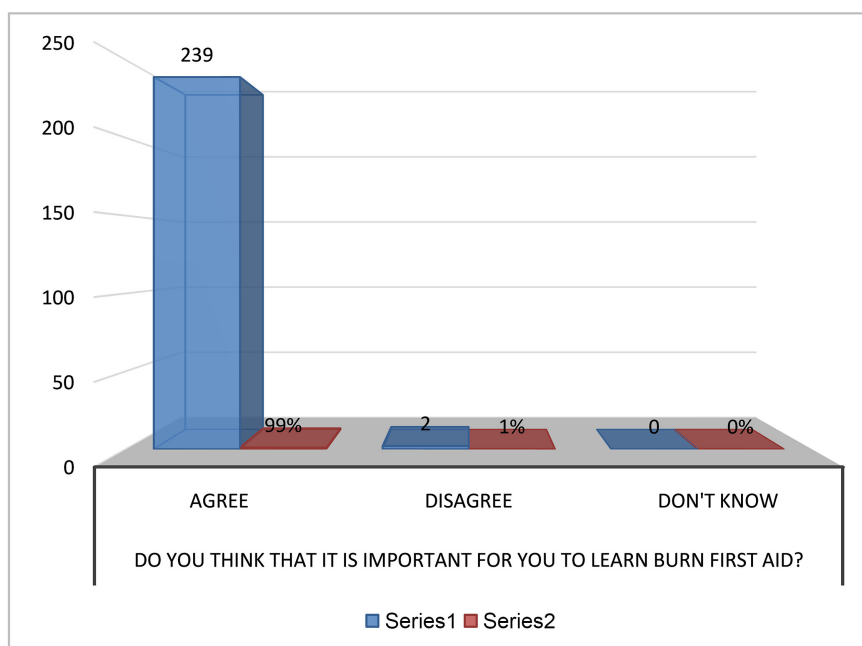


Figure 3. Participants attitude towards to BFA.

Table 3. Participants attitude towards burn first aid.

Questions	Response	Frequency	N%
Do you think applying dough, oil, mud or toothpaste etc on the wound delay healing process	Agree	84	35%
	Disagree	78	32%
	Don't know	79	33%
Do you think applying traditional remedies are good for burn care before going to the health facility?	Agree	84	35%
	Disagree	101	42%
	Don't know	57	24%
Do you think that burn first aid is a basic skill that everyone should know?	Agree	239	98%
	Disagree	4	2%
	Don't know	0	0%
Do you think that it is important for you to learn burn first aid?	Agree	239	99%
	Disagree	2	1%
	Don't know	0	0%

4. Discussion

This study focused on the evaluation of community knowledge and attitude about BFA and related factors in Jazan City, Saudi Arabia. The study observed that the majority of participants (75%) did not have any form of BFA training in the past. Additionally, the study found that 69.9% of participants had inadequate knowledge although 72% of participants had a favorable attitude toward burn first aid. Age, education status, and previous burn-related first aid training were significantly associated with participants' knowledge of burn first aid at a *P*-value less than 0.05. Specifically, people with higher age and those with a university degree had a higher level of knowledge. Moreover, participants who participated in previous BFA training had more knowledge.

Similar studies have been conducted in different countries that also assessed the knowledge and attitude of communities towards BFA for example, Rostami *et al.* [22] from Iran found that only 4.4% of participants had adequate knowledge of burn first aid, while Khan *et al.* [23] from Pakistan found that the majority of participants had inadequate knowledge of BFA. These studies suggest that there is a need for community education and training in BFA to improve knowledge and attitudes towards this important topic.

Al-Mousawi *et al.* [24] showed that 73% of participants knew that washing with cool water was the correct first aid step for burns, which is higher than the percentage found in our study. However, similar to our study, only 7.5% of participants knew that the duration of washing should be longer than 15 minutes. Alzahrani *et al.* [25] in their study in Riyadh, showed that 77.7% of participants knew that washing the burned area with cool water is the correct first aid step. This study also found that only 6.3% of participants knew the correct duration of washing, which is similar to the finding in our study. Rostami *et al.* [22] from Iran showed that 79.6% of participants knew that cool water is the correct first aid step for burns, which is higher than the percentage found in our study. However, as with our study, only 10.4% of participants knew that the duration of washing should be longer than 15 minutes.

A study from Jordan [26] showed that 59% of the participants knew that covering the burned area with a clean cloth can help reduce the risk of infection which has similar findings with our study (60%). However, in contrast to our study which showed a higher percentage (84%) of participants knowing about covering the burned area correctly with a clean cloth as the appropriate material, the Jordanian study showed a lower percentage. Rezaei *et al.* [27] in Iran also reported a higher percentage (95%) of participants who correctly identified a clean cloth as the appropriate material to use for covering the burned area.

It is worth noting that although a significant percentage of participants knew about covering the burned area with a clean cloth, it is essential to emphasize the importance of using a clean cloth to prevent infection. Dutta *et al.* [28] in India found that the use of contaminated or dirty material to cover the burned area was associated with an increased risk of infection. A significant proportion of

participants (28%) in our study believed that toothpaste could be used to treat burns is concerning, as this is a common misconception that has been previously reported in other studies. Gokdemir *et al.* [29] in Turkey found that 48.7% of participants believed that toothpaste could be used to treat burns. Similarly, Qadir *et al.* [30] from Pakistan found that 41.8% of participants believed that toothpaste was a suitable treatment for burns. These findings suggest that there is a lack of awareness among the general population about the appropriate first-aid measures for burns. It is important to educate the public about the correct first aid measures for burns, including the fact that applying toothpaste or other home remedies can be harmful and delay proper medical treatment. Healthcare professionals should take an active role in educating their patients and communities about the appropriate first-aid measures for burns. Johnson *et al.* [31] found that age, education status, and previous first-aid training were found to be associated with a higher knowledge of BFA. This is consistent with our study where these same factors were also found to be significantly associated with knowledge of BFA 73%.

It is promising to see that the vast majority of participants in this study recognize the importance of learning BFA. Moreover, the fact that almost all participants (99%) in our study recognized BFA as a basic skill that everyone must know, is also in line with previous research. Bilir *et al.* [32] in Turkey found that 99.3% of their participants believed that it is important to learn first aid skills. Similarly, Khan *et al.* [23] in Pakistan reported that 96.3% of their participants believed that basic first aid knowledge is essential.

Limitations

The study sample is small and represents only a fraction of the society. More extensive studies in future can shed more light to BFA in our society.

5. Conclusion

The fact that 75% of the participants did not receive any form of BFA training in the past is a cause for concern, especially given the high incidence of burns in the region. The finding that 69.9% of the study participants have inadequate knowledge about burn first aid underscores the need for urgent action to improve education and training in this area. Despite the majority of participants (72%) having a favorable attitude towards burn first aid, this attitude alone is not enough to ensure that they can provide effective first aid in the event of a burn. The study also highlights the need to consider factors such as previous burn-related first-aid training, age, and educational status when designing interventions aimed at improving knowledge about burn first aid. Addressing this issue will require a concerted effort from healthcare professionals, policy-makers, and community leaders. By developing and implementing effective education and training programs, it may be possible to reduce the incidence and severity of burns and improve the quality of care provided to burn victims in the region.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

References

- [1] WHO (2018, March 16) Burns. <https://www.who.int/en/news-room/fact-sheets/detail/burns>
- [2] Żwieręło, W., Piorun, K., Skórka-Majewicz, M., Maruszewska, A., Antoniewski, J. and Gutowska, I. (2023) Burns: Classification, Pathophysiology, and Treatment: A Review. *International Journal of Molecular Sciences*, **24**, Article 3749. <https://doi.org/10.3390/ijms24043749>
- [3] Karimi, H., Montazeri, M., Shamsi, M. and Jafary, L. (2017) Assessment of Knowledge, Attitude, and Practice of Burn First Aid among a Sample of the General Population in North of Iran. *Journal of Education and Health Promotion*, **6**, Article 89.
- [4] Othman, N. and Kendrick, D. (2010) Epidemiology of Burn Injuries in the East Mediterranean Region: A Systematic Review. *BMC Public Health*, **10**, Article No. 83. <https://doi.org/10.1186/1471-2458-10-83>
- [5] Mlcak, R.P., Buffalo, M.C. and Jimenez, C.J. (2012) Pre-Hospital Management, Transportation and Emergency Care. *Total Burn Care*, **2012**, 93-102. <https://doi.org/10.1016/b978-1-4377-2786-9.00007-2>
- [6] Hamdiya, A., Pius, A., Ken, A. and Paa Ekow, H.-W. (2015) The Trend of Acute Burns Pre-Hospital Management. *Journal of Acute Disease*, **4**, 210-213. <https://doi.org/10.1016/j.joad.2015.03.002>
- [7] Mohammed Qtait, K.A. (2019, April 21) First Aid: Level of Knowledge of Relatives in Emergencies in Burn. *International Journal of Biomedical and Clinical Sciences*, **4**, 24-28.
- [8] Smolle, C., Cambiaso-Daniel, J., Forbes, A.A., Wurzer, P., Hundeshagen, G., Branski, L.K., Huss, F. and Kamolz, L.-P. (2017) Recent Trends in Burn Epidemiology Worldwide: A Systematic Review. *Burns*, **43**, 249-257. <https://doi.org/10.1016/j.burns.2016.08.013>
- [9] Mishra, S.K., Mahmood, S. and Baig, M.A. (2018) Burn First Aid Knowledge and Its Determinants among General Population of Rawalpindi. *European Journal of Trauma and Emergency Surgery*, **45**, 1121-1128. <https://doi.org/10.1007/s00068-018-0996-6>
- [10] Wood, F.M., Phillips, M., Jovic, T., Cassidy, J.T., Cameron, P. and Edgar, D.W. (2016) Water First Aid Is Beneficial in Humans Post-Burn: Evidence from a Bi-National Cohort Study. *PLOS ONE*, **11**, e0147259. <https://doi.org/10.1371/journal.pone.0147259>
- [11] Harish, V., Tiwari, N., Fisher, O.M., Li, Z. and Maitz, P.K.M. (2019) First Aid Improves Clinical Outcomes in Burn Injuries: Evidence from a Cohort Study of 4918 Patients. *Burns*, **45**, 433-439. <https://doi.org/10.1016/j.burns.2018.09.024>
- [12] Gete, B.C., Mitiku, T.D., Wudineh, B.A. and Endeshaw, A.S. (2022) Knowledge, Attitude, and Practice towards Burn First Aid and Its Associated Factors among Caregivers Attending Burn Units in Addis Ababa, Ethiopia. A Cross-Sectional Study. *Annals of Medicine & Surgery*, **81**, Article 104402. <https://doi.org/10.1016/j.amsu.2022.104402>
- [13] Wallace, H.J., O'Neill, T.B., Wood, F.M., Edgar, D.W. and Rea, S.M. (2013) Determinants of Burn First Aid Knowledge: Cross-Sectional Study. *Burns*, **39**, 1162-1169.

- <https://doi.org/10.1016/j.burns.2013.02.007>
- [14] Graham, H.E., Bache, S.E., Muthayya, P., Baker, J. and Ralston, D.R. (2012) Are Parents in the UK Equipped to Provide Adequate Burns First Aid? *Burns*, **38**, 438-443. <https://doi.org/10.1016/j.burns.2011.08.016>
- [15] Harvey, L.A., Barr, M.L., Poulos, R.G., Finch, C.F., Sherker, S. and Harvey, J.G. (2011) A Population-Based Survey of Knowledge of First Aid for Burns in New South Wales. *Medical Journal of Australia*, **195**, 465-468. <https://doi.org/10.5694/mja11.10836>
- [16] Mortada, H., Malatani, N. and Aljaaly, H. (2020) Knowledge and Awareness of Burn First Aid among Health-Care Workers in Saudi Arabia: Are Health-Care Workers in Need for an Effective Educational Program? *Journal of Family Medicine and Primary Care*, **9**, 4259-4264. <https://doi.org/10.4103/jfmpc.jfmpc.811.20>
- [17] Abu alqam, R., Awan, B., Alsulymani, B., Malaika, L., Al-Rezqi, M., Malaikah, A. A. and Alqarni, S. H. (2023) Evaluation of Perception, Awareness, and Practices Related to Burns First Aid: Largest Cross-Sectional Study among Non-Healthcare Providers in the Western Region of Saudi Arabia. *Cureus*, **15**, e33839. <https://doi.org/10.7759/cureus.33839>
- [18] Jeschke, M.G., van Baar, M.E., Choudhry, M.A., Chung, K.K., Gibran, N.S. and Logsetty, S. (2020) Burn Injury. *Nature Reviews Disease Primers*, **6**, Article No. 11. <https://doi.org/10.1038/s41572-020-0145-5>
- [19] AlQahtani, F.A., Alanazi, M.A., Alanazi, M.K., Alshalhoub, K.S., Alfarhood, A.A. and Ahmed, S.M. (2019) Knowledge and Practices Related to Burn First Aid among MAJMAAH Community, Saudi Arabia. *Journal of Family Medicine and Primary Care*, **8**, 594-598. <https://doi.org/10.4103/jfmpc.jfmpc.382.18>
- [20] Hejase, H.J., Hejase, A.J. and Hejase, H.A.N.J. (2012) Quantitative Methods for Decision Makers: Management Approach. Dar Sader Publishers, Beirut, 129 p.
- [21] Hejase, A.J. and Hejase, H.J. (2013) Research Methods: A Practical Approach for Business Students. 2nd Edition, Masadir Incorporated, Philadelphia.
- [22] Rostami, S., Aminizadeh, M., Jalilian, M. and Khoshsimae, S. (2017) Knowledge of the General Population about the First-Aid Management of Burns in Iran: A Systematic Review and Meta-Analysis. *Burns*, **43**, 1411-1418.
- [23] Khan, A.S., Hussain, S.A., Hamza, M. and Ali, S. (2014) Knowledge, Attitude and Practices of Basic Life Support among Medical Students in Rawalpindi. *Journal of Rawalpindi Medical College*, **18**, 187-190.
- [24] Al-Mousawi, A., Al-Shawi, H. and Mohammed, A. (2013) Awareness of Burn First Aid among a Saudi Population in Riyadh City. *Burns*, **39**, 1395-1399.
- [25] Alzahrani, A., Alrajhi, M., Alshaalan, N., Alreshidi, N., Almutairi, M., Alqurashi, A. and Almogbel, E. (2019) Awareness of Burn First Aid among Saudi Population. *Saudi Medical Journal*, **40**, 343-348.
- [26] Al-Quran, F.A. (2016) Community Knowledge and Practices Regarding Burn First Aid in Jordan. *Burns*, **42**, 929-933.
- [27] Rezaei, S., Ardalan, A., Bouzarjomehri, F., Mohammadinia, L. and Sarvar, M. (2016) Assessment of Community Knowledge and Awareness toward Burns in Tehran, Iran. *Journal of Injury and Violence Research*, **8**, Article 17.
- [28] Dutta, R., Kumar, P. and Puri, J. (2018) Study of Knowledge and Practices of First Aid among General Population. *International Journal of Community Medicine and Public Health*, **5**, 1008-1012.
- [29] Gokdemir, M.T., Ucan, H.B., Celik, M., Duygu, A. and Kocak, A.O. (2016) Know-

- ledge and Attitudes of the Turkish Public about Burns. *Journal of Burn Care & Research*, **37**, e357-e363. <https://doi.org/10.1097/BCR.0000000000000301>
- [30] Qadir, M.I., Nadeem, M.A., Malik, N.A. and Rasheed, A. (2016) Community Knowledge about First Aid of Burns in Lahore, Pakistan: A Cross-Sectional Study. *World Journal of Plastic Surgery*, **5**, 147-154.
- [31] Johnson, L.K., Davis, K.R. and Wilson, M.N. (2017) Factors Associated with Knowledge of Burns First Aid among Community Members. *Burns*, **43**, 567-573.
- [32] Bilir, N., Bozan, O. and Ozkan, S. (2013) Knowledge of First Aid Skills among University Students in Health-Related Departments. *Pakistan Journal of Medical Sciences*, **29**, 652-656.