

## ORIGINAL ARTICLE

# Epidemiology, aetiology and knowledge, attitudes, and practices relating to burn injuries in Palestine: A community-level research

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## Abstract

The aim of this study was to identify the epidemiology, aetiology as well as the knowledge, attitudes, and practices relating to burn injuries in Palestine. A mixed-method approach was used. A survey was distributed to a total of 1500 households selected by randomised approach. The survey was standardised based on World Health Organisation's guidelines for conducting community surveys on injury. Additionally, there were 12 focus group discussions and 10 key informant interviews to collect rich qualitative data. In the West Bank and Gaza, 1.5% of Palestinians had experienced serious burn injuries in the 12 months. The total sample of 1500 yields a margin of error (plus/minus) = 2.5% at a 95% level of confidence and a response distribution ( $P = 50%$ ) with 3% non-response rate. Of the 1500 households approached, 184 reported a total of 196 burn injuries, with 87.2% occurring inside the home: 69.4% were females and 39.3% were children. The main source of reported cause of burn was heat and flame (36%), electric current (31.6%), hot liquid (28.6%), and chemicals (2.7%). The most common first aid for burns was pouring water (74.7%). People in rural, refugee, and Bedouin settings had the highest incidence of burns. This study provides the burn prevalence rate, explanatory factors that contribute to the frequency of burns in Palestine. Making burn prevention a higher priority within the national policy is crucial.

**List of Abbreviations:** CCS, Country Cooperation Strategy; FGDs, focus group discussion; GS, Gaza Strip; HICs, high-income countries; HHs, households; INGOs, International Non-governmental Organisations; KIIs, key informant interviews; KAP, knowledge, attitudes, and practices; LMICs, low- and middle-income countries; MAP-UK, Medical Aid for Palestinians-United Kingdom; MENA, Middle East and North Africa; MoEd, Ministry of Education; MoH, Ministry of Health; NIHR, National Institute for Health Research; oPt, occupied Palestinian territory; OCHA, Office for Coordination of Humanitarian Affairs; PCBS, Palestinian Central Bureau of Statistics; PSUs, primary sampling units; CGBIPR, The Centre for Global Burn Injury Policy and Research; EMRO, The Eastern Mediterranean Region; UN, United Nations; UNFPA, United Nations Population Fund; WB, West Bank.

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**Key Messages**

- there is a lack of reliable and rigorous research on burn epidemiology in Palestine. Therefore, this study aimed to identify the epidemiology, aetiology and the knowledge, attitudes and practices (KAPs) for burn injuries at the community level in Palestine
- a survey was developed and distributed to 1500 households selected by randomized approach. Additionally, 12 focus group discussions and 10 key-informant interviews were conducted
- results showed that 1.5% of Palestinians in the West Bank and Gaza Strip had experienced serious burn injuries in the previous 12 months
- people in rural, refugee and Bedouin settings had the highest incidence of burns
- burn injuries should be included in the national health strategy in Palestine

**KEYWORDS**

burn, epidemiology, Gaza, implementation science, West Bank

## 1 | INTRODUCTION

### 1.1 | Global context

Burn injuries are a significant global public health problem. Fire-related deaths account for an estimated 180 000 deaths annually, with a disproportionate burden being sustained in low- and middle-income countries (LMICs). Burn injuries are a significant cause for disfigurement and disability and a leading cause of disability-adjusted life years in LMICs.<sup>1</sup> Furthermore, paediatric mortality resultant of burn injuries is seven times higher in LMICs than in high-income countries (HICs). The comparatively low numbers of burn injuries in many HICs create a strong impetus to address the problem in LMICs, as it clearly demonstrates that they are preventable. Despite this, burns receive little attention on the global health agenda and are deemed the “forgotten global health crisis.”<sup>1</sup>

### 1.2 | Local context

Countries across the Eastern Mediterranean Region (EMRO) (as defined by WHO), including the occupied Palestinian territory (oPt), are seeing a rise in burn injury related deaths and physical deformities, particularly among females and children.<sup>2</sup> In the oPt, the Ministry of Health (MoH) estimates that there are 7600 burns annually in the West Bank (WB) and 8685 in Gaza Strip (GS), of which 65% are paediatric.<sup>3</sup> Congruent with this, a study of the distribution of burn patients in Gaza city at Shifa hospital indicated that approximately 63% of admitted patients were children aged under 10 years old.<sup>2</sup>

Another study in the WB showed that 51% of admitted burn patients were children aged under 10 years, 32.4% were aged between 11% and 20%, and 15.4% were more than 21 years old.<sup>4</sup> The same study showed that 62.3% of burn patients were female and the majority of burns occurred during winter.<sup>4</sup> In addition to this, several studies explored the prevalence, causes, knowledge, and practices of people towards burn injuries in the oPt but only at the district level in both GS and WB.<sup>2,4-6</sup> Again, these results showed that the majority of admitted burn cases were children, with the burn occurring mostly inside the home.

In addition to the domestic sources of burns, the oPt also sees burn injuries in mass casualty events; for example, on March 25, 2020, Palestinians, including six children and four women, were killed in a fire caused by a gas leak in a local market at Nuseirat refugee camp in the GS.<sup>7</sup> Another 58 people needed treatment in the intensive care unit. In a similar incident, three children were killed in a fire at their home in the same refugee camp.<sup>8</sup>

The high prevalence of burn injuries is linked with the context of low incomes, large families, high unemployment, and substandard living conditions and poverty, which are high-risk factors for burn injuries.<sup>9-13</sup> This is consistent with the poor socio-economic situation in the oPt, particularly in GS where 53% of Palestinians live in poverty.<sup>14</sup>

### 1.3 | Outline and rationale for the study

Comprehensive and accurate analysis of the contextual factors of burns, surrounding burn rates and gaps in service

delivery is essential for the development of long-term burn prevention programmes. This is a challenge in the oPt as the health sector is increasingly fragmented and overstretched, presenting a difficult working environment for health agencies. This fragmentation is difficult to examine sufficiently both at a structural and functional level, which puts a huge burden on the Palestinians Ministry of Health (MoH) in developing long-lasting strategies.<sup>15</sup> Moving forward, it is crucial to have local, accurate data on epidemiology and the risk factors, which enable health organisations to implement meaningful policy change and contextualised burn prevention interventions. This study utilised community surveys to help address the need for more data surrounding burns in low-resource settings.

## 2 | MATERIALS AND METHODS

### 2.1 | Study design

The study involved a baseline survey on burn injury epidemiology, aetiology and community knowledge, attitude, and practices with regard to burn prevention and first aid. A mixed-method approach was used, with quantitative and qualitative data generated through a mix of community surveys, focus group discussions (FGDs), and key informant interviews (KIIs). The research covered both WB and the GS, with three contrasting sites in each territory to ensure information was collected from urban, rural, and Bedouin areas. In each site 250 households (HHs) were covered: a total of 1500 HHs. The exact sites for the community surveys were identified and agreed by the MoH-led steering committee on burns in the MoH in the WB.

### 2.2 | Study instrument

The standardised community survey was developed in 2017 by Interburns (International Network for Training Education and Research in Burns) and the Centre for Global Burn Injury Policy and Research (CGBIPR) at Swansea University, based on the WHO's Guidelines for conducting community surveys on injury framework. This survey covers a wide range of factors including the epidemiology of burns as well as respondents' knowledge, attitudes, and practices (KAP) towards injury risks and burn injury management. This survey was successfully field-tested in several districts of Palestine and adapted based on feedback from respondents and the survey field teams. Some questions or answers that were deemed as incongruent with security concerns of the government in Gaza were removed from the survey. Those include questions on the length of journey to reach a treatment site of

the burned case and all answers that were open-ended. To make up for any deletions, the authors utilised the FGDs and the KIIs approach to bring a deeper understanding of these issues.

Following the pilot phase, the survey was conducted on a larger scale, focusing on certain locations in the GS and WB, with the results of this survey being the focus of this paper. The aim of the survey was to provide information that can inform the design and delivery of future primary prevention programmes in the selected communities and in the whole oPt eventually.

### 2.3 | Sample size

The total number of individuals listed in the HHs visited was 8166, with an average family size of 5.44, consistent with the latest census data of 2017 of the Palestinian Central Bureau of Statistics (PCBS).<sup>16</sup>

### 2.4 | Sampling technique

This study was implemented within selected governorates in WB and GS purposively, but HHs within each community were selected using a randomised systematic approach. In this regard, a multistage stratified sample using probability proportional to size was used as a sampling approach within the selected governorates (communities). In this case, the first stratum is the governorate and the second stratum is the locality (or equivalent). The results of the latest population census were used as its sampling frame to map out all the targeted localities in the governorate including population size in each locality.<sup>16</sup> In each selected contrasting community, a total of 250 questionnaires was distributed in the sub-communities (locality). Each locality was assigned a number of questionnaires proportional to its population size. Each locality was divided into primary sampling units (PSUs) with the use of existing maps that detail neighbourhoods, streets, and housing units. Each locality was divided into a number of sampling units with about 100 HHs each. A probability proportional sample of 150 PSUs was determined through maps of the localities selected. From each PSU, HHs were selected using a systematic random sampling process, using fixed interval (1 out of 10). An average of 10 households was sampled per PSU, providing for a total sample of 1500 households. The number of clusters within each population includes one cluster in Hebron, three in Nablus, and nine in Jericho/Jordan valley. These sites were selected to capture the contrasting nature of Palestinian realities in terms of region, level of urbanisation/ruralisation, taking

into consideration the Bedouin communities, distance from urban centres, refugee status, proximity to the separation wall in the WB, and the borders in GS.

## 2.5 | Data collection

### 2.5.1 | Interviews and FGDs

All interviews were conducted by a research team trained on qualitative data collection for this specific project. The interviews were face-to-face within the HH, and the selection of the respondent was based on the ability of this person to represent the HH and their knowledge of the issue of burns in relation to their own family.

Twelve FGDs were conducted by the same research team as the HH interviews, with various stakeholders across the targeted region, including 153 teachers, local elected leaders, and women's groups or cooperative members. FGDs were also organised with parents, women, and other caregivers. Additionally, FGDs were conducted with medical professionals, nurses, community, and health workers. Ten KIIs were conducted with experts working in this field, including the responsible units in MoH in both the WB and GS, steering committee members, specialised units in the relevant hospitals, health workers, and community leaders.

## 2.6 | Ethical considerations

The ethical approval for this study was reviewed and approved by the existing review mechanism of the Palestinian Health Research Council (Helsinki Committee). Moreover, head of households who have been interviewed provided written informed consent to participate in this study. The consent was a written document that elaborated the voluntary nature of participation, the no harm principles, and the privacy and confidentiality clauses. All participating caregivers had to sign the consent form before starting the interview process.

## 3 | RESULTS

### 3.1 | Prevalence of burns

The total sample of 1500 yields a margin of error (plus/minus) = 2.5% at a 95% level of confidence and a response distribution ( $P = 50\%$ ). The survey shows that 1.5% of Palestinians in the oPt sustained a serious burn that required medical attention (outside of the home in any type of health facility/post) and/or were unable to carry out normal daily activities for at least 24 hours, during the 12 months prior to

TABLE 1 Prevalence rate per region and community

Region/community	Prevalence rate
Deir Al Balah (refugee camps)	1.59%
North Gaza (rural/Bedouin)	2.35%
Gaza city (urban)	1.00%
Total—Gaza Strip	1.64%
Nablus (refugee camps)	1.75%
Jericho/Jordan Valley (rural/Bedouin)	1.79%
Hebron city (urban)	0.08%
Total—West Bank	1.20%
Total—West Bank and Gaza Strip	1.50%

the survey. The rates for the six contrasting communities are shown in Table 1. The results show that prevalence in GS is higher (1.64%) than in the WB (1.20%). Also, in the targeted regions in the WB, the prevalence rates are highest in refugee camps and the rural/Bedouin communities and lowest in urban centres. In GS, the rate is highest in the rural/Bedouin communities, followed by refugee camps, and then lowest in urban centres.

In addition, FGD participants and health practitioners emphasise the higher prevalence and severity of burns during the winter. To them this is because of the following:

“Winter is the time when families sit crammed in one room around the gas heater or the burned wood; it is a huge risk especially when you have children and elderly” (Community health worker, Khan Younes).

“People die from inhaling fumes resulting from closing all the doors and windows, while keeping the heater on” (Community health worker, Hebron).

“During the winter, children tend to ignite more fires in the backyard of the house; they like to think that is for heating, but it is more for plying” (Mother, Jordan Valley).

### 3.2 | Distribution of burn injuries

Figure 1 shows the total number of burn injuries reported per household reporting a burn. In total, 184 HHs of the 1500 approached reported burns. Among them, 175 reported one burn injury, while nine reported two, and one reported three burn injuries. Of these burn victims, only 124 were taken to a health facility and the rest 72 were treated at

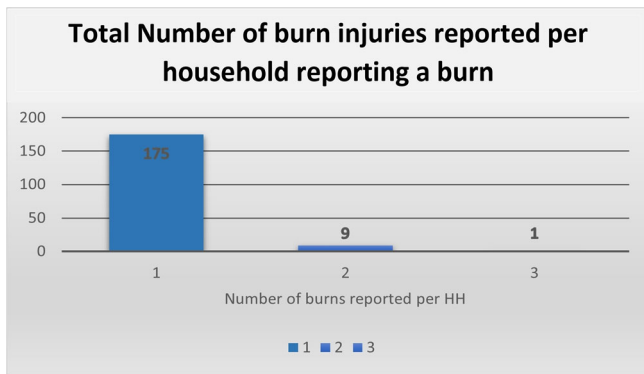


FIGURE 1 Number of burn injuries reported per household reporting a burn

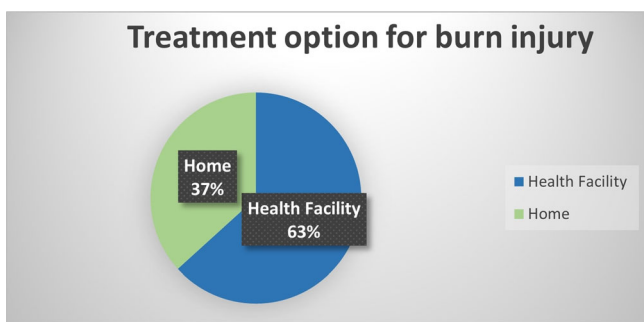


FIGURE 2 Treatment option for burn injury

home (see Figure 2). The 72 cases who were treated at home had minor enough injuries and did not require further treatment.

### 3.3 | Distribution of socio-demographic characteristics of burn injuries

As seen in Table 2, our results show that more than two-thirds of the reported burns were in the GS (69.4%) and the rest (30.6%) were in the WB. The results showed that burn injuries were most frequent among HHs in the refugee camps, followed by rural communities, and the least number was reported in urban areas.

In terms of gender, the survey showed that most burns were sustained by females (69.4%), while less than a third of burns were reported in male HH members. Of the participants who reported a burn, 41.8% were female home caretakers. In relation to the distribution of burns by age group, children (defined as less than 18 years old) comprised the largest proportion of reported burn injuries (39.3%). In addition, the vast majority of burned individuals live in nuclear families (88.8%) and (11.2%) live within extended families.

TABLE 2 Distribution of socio-demographic characteristics of burn injuries (N = 196)

Locality	Frequency	%
Gaza Strip	136	69.4
West Bank	60	30.6
Targeted community		
Gaza middle—refugee camps	57	29.1
North Gaza—rural areas	48	24.5
Gaza	31	15.8
Jericho and Jordan Valley—rural and Bedouin	25	12.8
Nablus—refugee camps	24	12.2
Hebron	11	5.6
Type of family		
Nuclear family	174	88.8
Extended family	22	11.2
Gender		
Male	60	30.6
Female	136	69.4
Age group		
8 y or less	47	24
9-17	30	15.3
18-30	39	19.9
31-50	56	28.6
+51	24	12.2
Occupation		
Home caretaker	82	41.8
Unemployed	46	23.5
Student	45	23
White-collar employee	10	5.1
Labourers	8	4.1
Professional	2	1
Farmer	1	0.5
Craftsmen	1	0.5
Retired	1	0.5

### 3.4 | Knowledge of study participants towards burn injuries

The results in Table 3 show that most of the total sample agree that burns can cause bad scars, with 93.4% either agreeing or strongly agreeing. The data also showed that 28.4% of the sample believe that most people with burns die because of their injury. In terms of prevention, 64.6% of the total sample agreed that most burns are preventable. Despite many respondents believing that burns are preventable, the FGDs and KIIs also indicated a level of



TABLE 3 Knowledge of study participants about management of burn injuries

Beliefs	Strongly agree N (%)	Agree N (%)	Neutral N (%)	Disagree/strongly disagree N (%)
Burns can cause bad scars	39.3 (42.6)	54.6 (50.8)	—	6.1 (6.6)
Most burns are preventable	13.3 (12.1)	55.1 (52.5)	24 (22.5)	7.6 (12.9)
Most people with burns die because of injury	3 (4.8)	28.1 (28.4)	44.9 (29)	24 (37.8)

fatalism among study participants, with many discussing their perceived lack of control in preventing burn injuries:

“It is God’s will; nothing could be done to prevent a burn” (Woman, Jordan Valley).

“As much as you try; accidents will happen” (Male, North Gaza).

“If it is the will of God; there is nothing that you could do about it” (Woman, Middle Gaza).

“What our children will do and when they get in trouble, we can’t do anything about that; it is not in our hand.” (Woman, Nablus Refugee Camps). The fatalistic beliefs are backed by a sense of isolation and limited access to services as revealed in the qualitative data:

“Those who live in remote areas and in Area C find it difficult to get immediate help for serious injuries and as such wait and that leads to complicating the case, leading to death” (Health Specialist, WB).

“When you have no financial resources to get help for your child, you will wait and some die because of that” (Man, Hebron).

“Some families will go for the cheaper and available option of traditional medicine in their community; this leads to conditions that are not amenable for help at a later stage” (Medical specialist, Gaza).

### 3.5 | First aid practices when exposed to burn injuries

The survey asked participants what they would do in the case of a burn injury in order to better understand the level of knowledge the population had around best

practice for treating burns. Of the respondents, 68.6% answered that if hot water was spilled on their arm or on a family member, they would immediately apply cold water, 14.5% said that they would apply a medical ointment such as toothpaste and 3.7% said they would apply aloe vera. Roughly 12.5% said that they would apply other materials. The data revealed that HHs with a previous burn experience had more knowledge around the best way to treat a burn, with 86.7% saying that they would apply cold water, as seen in Table 4. This best practice was backed by medical specialists from burn units in Hebron and Nablus hospitals:

“The best way to deal with a burn is to immediately apply cold water” (Doctor, Hebron burn unit).

“Most people don’t know that they should only use cold water or towel; they apply the wrong materials such as ointments preventing the burn from breathing and healing” Nurse, Nablus burn unit).

In the case of clothing catching fire, most of the overall sample said they would smother the person with cloth. The second most common option was taking off the clothes, followed by jumping in water. In terms of where a family would take a person with a minor burn immediately, HHs with prior burn experience were more trusting of traditional healers (48%), compared with among the overall sample (35.3%). HHs with prior experiences with burn injuries were also less trusting of modern medical facilities (health posts, clinics, and burn units in hospitals) compared with the overall sample (21.3% vs. 33.5%).

### 3.6 | Sources of risk of burns

Table 5 shows the main sources of risk of burns. Heat and flame were perceived as the main sources as 36% reported such a risk. This was followed by electric current, reported by 31.6%, hot liquid reported by 28.6%, and chemicals reported by 2.7%. The rest (1.2%) either report

**TABLE 4** First aid practices of study participants in burn injuries

First aid behaviour when hot liquid spilled on patients' arm	Average for all HHs	HHs with burns
Apply cold water	86.7	68.6
Apply aloe vera	2	3.7
Apply ointment/paste	6.1	14.5
Other	5.1	12.5
First aid behaviour when clothes caught fire		
Stop, drop, and roll	4.6	5.6
Smother with cloth	58.2	61.5
Jump in water	14.3	9.1
Run	3.1	3.9
Take off clothing	17.9	16.6
Do not know/other	2	3.4
First aid treatment for a small/minor burn among a family member		
Traditional healer	48	35.2
Pharmacy	28.6	26.4
Health post/clinic	17.3	27.2
Community health worker/nurse	2	1.4
Primary health unit/hospital	2	4.9
Other	2	4.5

**TABLE 5** The key risk of getting a burn injury

Source of risk	Average for all HHs	HHs with burns
Heat and flame	36.0	32.4
Electric current	31.6	23.8
Hot liquid, steam, or gas	28.6	37.3
Chemicals	2.7	4.3
Other/do not know	1.2	2.1
Total	100.0	100.0

other risks or do not know. HHs reporting burns assess risk differently, where hot liquid/steam and gas are considered as the key risk factor by 37.3%, followed by heat and flame (32.4%) and electric current (23.8%).

## 4 | DISCUSSION

### 4.1 | Occupied Palestinian territory level

To the best of our knowledge, this is the first study in the oPt to examine the epidemiology, aetiology, and KAP of

burn injuries at the community level. Our findings showed that 1.5% of study participants in the oPt had been exposed to serious burn injuries requiring medical attention and/or led to being unable to carry out normal daily activities, such as work or school, for at least 24 hours. This is much higher than for the wider EMRO, which is reported at 0.00187%.<sup>17</sup> Some potential explanations for this discrepancy could be the fragmented health care system in the oPt, because of the large number of health providers distributed across several sectors,<sup>18</sup> as well as the financial and economic hardships of Palestinians living with the devastating conditions and suffering caused by the occupation, restrictions of movement, blockade, chronic electricity outages in Gaza, high unemployment, and lack of access to health care services.<sup>19</sup> These factors create many barriers to developing good health education capacity and implementing prevention programmes.

### 4.2 | High risk groups

The findings from this study showed that burn prevalence rates were higher among refugee and rural communities than in urban communities. This pattern had been observed by other studies in other countries, such as China, Ethiopia, and Nepal.<sup>20-22</sup> This was also consistent with other findings reported in Turkey,<sup>23</sup> which indicated that more than 52% of admitted burn cases into a university hospital lived in rural areas wherein burns occur more frequently in such areas with deeper, larger, and more fatal burn characteristics. This was partly attributed to the lack of access to transportation to the treatment units in addition to the lack of prevention measures.<sup>23</sup>

These results from the current study are also in line with a WHO report that found that children in refugee areas were among the high-risk groups for burn injuries, which was explained by the poor physical and socio-economic factors such as poor housing, overcrowded HHs, absent or unreliable electrical supply, lack of separation between kitchen and other areas in addition to the sustained case of poverty.<sup>24</sup>

The current study also found that Palestinians in the GS reported a much higher incidence of burns over the 12 months prior to the survey than their WB counterparts. The poor health outcomes may be explained by the conditions in the GS, which have a dramatic impact on the health of the roughly 2 million Palestinians living there, because of exposure to a tight closure and siege that has led to a decaying infrastructure and a limited supply of basic goods.<sup>25</sup> Moreover, Gaza is categorised at a higher risk because of the relatively substandard living conditions with higher poverty and unemployment rates evidenced by the electricity crisis and irregular supply,

which cause various additional health, hygiene problems, and burn injuries.<sup>26,27</sup>

Of the respondents who reported burns, the age group who sustained the largest number of burns was children (classified as under 18), comprising 39.3% of this group. This pattern of children being high risk is in line with the literature.<sup>17,28-31</sup> For example, a systematic review assessing the epidemiology of burns across 81 hospital-based and 11 population-based studies found that children are the most high-risk group for burns, which mostly occur at home.<sup>32</sup>

This study also indicated that females are high risk and comprise the majority of respondents who reported a burn. This result could be explained by the fact that women in LMICs tend to spend significant time in the kitchen cooking, exposing them to equipment such as heaters and cooking stoves.<sup>33</sup> Again, this is in line with findings from the literature; for example, a study conducted in rural areas of Nepal indicated that the prevalence of burn injuries among women was 1.1% compared with 0.5% among men.<sup>22</sup>

The most common place in which burn injuries occurred was at home, comprising 87.2% of the reported injuries. This finding is supported by studies from other countries such as China, Nepal, Jordan, Nigeria, Egypt, and Pakistan<sup>20,22,31,34-36</sup> in addition to the findings of community surveys conducted in Bangladesh and Ethiopia, which showed that 80% to 90% of burns happen at home.<sup>1</sup> Moreover, our results indicated that the majority of burn injuries occurred among individuals who live in nuclear rather than extended families, which is reflective of the overall population where 89% of the families are nuclear.<sup>16</sup>

### 4.3 | Knowledge, attitudes, and practice (KAPs)

The current study also explored the contextual aspects and risk factors of exposure to burn injuries in addition to the KAP of such injuries, which included first management to burns, first aid, causes, and types of burns. Regarding initial first aid for burns, the findings showed that 74.7% of participants said that they would apply cold water to the affected area if hot liquid was spilled on them, which is similar to other studies where most participants applied water as a first aid treatment.<sup>5,20,34-43</sup> Pouring cold water on a burn injury was an immediate first aid method used in some households; however, because of the nature of the data collection, the time for which the water was applied is unknown.

Although many study participants were aware that applying cold water is the best course of action in the

event of a scald, there were other areas where correct knowledge was lacking. When asked what they would do in the case of their clothes catching fire, only 5.6% of participants said that they would “stop, drop and roll”, which is best practice. This reflects a need for increasing knowledge within the community around correct first aid for burn injuries. Raising awareness around burn injuries in the oPt can be difficult because of the fragmented health care system. However, there is the Health Education and Promotion Department in the MoH, which leads health education initiatives and programmes, including activities around burn awareness. In addition, there are some non-governmental organisations as Médecins sans frontières, which work on promoting good KAPs around burn prevention.

Our findings indicated that 35.2% of participants said that they would use substances such as toothpaste, honey, beeswax, olive oil, or other vegetable oils such as corn or sunflower, potato, egg whites, and yogurt to treat minor burns. Utilisation of unconventional substances to treat burns can be seen in other studies. For instance, a study conducted in Hebron in the WB found that 26.7% of respondents used toothpaste or tomatoes. A cross-sectional study was conducted among the Rawalpindi population to assess the general knowledge and practices around burns, and it showed that 47.5% of participants used toothpaste as first aid for burns.<sup>39</sup> Similarly, studies in the WB, Saudi Arabia, India, Bangladesh, and Iran<sup>5,38,44-47</sup> also reported toothpaste as a traditional first aid treatment option. Applying alternative substances to burns can be harmful; the risks associated with using such substances should be incorporated into burn health education campaigns to help improve treatment outcomes.

In addition, our findings revealed that the main causes of burns were heat and flame burns and scalds because of liquid or gas, with 67.6% reporting such risk. This could be related to keeping the gas cylinder inside the kitchen with a lack of safety measures. This finding is supported by other studies where most burn cases admitted to hospital were also caused by such kind of burn as in Iran with 40.5%, Iraq 71.6%, Egypt 84.7%, Jordan 88.8%, and Nigeria 63.4%.<sup>28,29,34,48,49</sup> This was also supported by previous studies included in a systematic review wherein authors showed that 92 hospitals and population-based studies revealed that the most common aetiology of burn injuries in homes was related to hot liquids and flames.<sup>32</sup>

Community burn prevention activities in the oPt hold several challenges because of a fragmented health care system, lack of resources, poor access to training opportunities because of movement restrictions, and is only restricted on achieving survival of individuals rather than



promoting their quality of life, which is the case of prevention activities in poorly resourced countries. In addition, burn prevention programmes were not included in the oPt health sector strategic plan of 2021 to 2025.<sup>50</sup> The scope of the study focused on the epidemiology and aetiology of burn injuries and provided ground breaking data and analyses on that; however, it seemingly lacked highlighting the deep and root cultural causes of burns in addition to the locally established traditional methods and/or healers for managing burns. This could be conducted in a separate future study. Moreover, the study was limited in its geographic scope as it covered a small number of communities and/geographical localities; while the authors were able to extrapolate national indicators based on the available data, a more comprehensive geographic coverage would provide a more robust and accurate account of the problem under study, which should be conducted in the future. In addition, communities that were part of the study were selected in a purposive way by the researchers in consultation with the MoH-led steering committee. The authors did not use any tests of significance of correlations as the main aim was to identify the prevalence rates in addition to KAP of burn injuries. Also, there are some questions that were deleted from the survey because of some security concerns from the ruling government in GS.

In parallel and to the best interest of our knowledge, this is the first study of its type to tackle epidemiology, aetiology, and KAP of burn injuries at the community level in Palestine and in the MENA region. In addition, the study tool was contextualised as per the situation and the study aim, which was done by piloting the tool. As a result, several additions and adjustments were made. They include the addition of Palestine-specific variables such as refugee camps and Bedouin communities. Another example is the addition of health providers that are not necessarily included in other contexts such as NGOs (as most of the primary care and prevention work is carried out by such NGOs) and UNRWA, which is a key provider of health services, especially in Gaza.

Despite the evidence provided by the WHO that burns are preventable,<sup>1</sup> this study found a high incidence of burns in the community. This provides an urgent impetus for the development of a national, coordinated burn prevention programme in the oPt. Currently, the key stakeholders for burn prevention and first aid treatment at the community level in the oPt include the MoH represented by the health education and promotion department, UNRWA, and NGOs. The types of programmes delivered include burn prevention campaigns and initiatives conducted for school's students in both MoH and Ministry of Education using face-to-face health education, using media such as radio channels and social

media platforms. However, the efforts exerted through these organisations are being conducted individually without a fully coordinated approach, and MoH-led activities are not implemented regularly.

A suggestion for a key aim when developing national burn prevention programmes in the future should be improving the KAPs around burn injuries in the population. This should include developing a nationwide campaign for health education around burn injuries, implemented with the MoH, Ministry of Education (MoEd) in communication with INGOs in the oPt. In addition, investment is needed to build the capacity of health care providers to upgrade their knowledge and skills in managing burn injuries. Development of new policies and programmes should be tailored to adapt to the needs of high-risk groups in the population. There should be emphasis on targeting women and children in particular, to improve their burn risk awareness and knowledge on how to manage burns if they are to occur. One of the main reasons women and children are high risk is because of the extended periods of time in the home, where the majority of burns occur. Therefore, efforts to ensure safe cooking and heating infrastructure in the home are needed, for instance, through stringent health and safety regulations.

There are currently no burn prevention policies being developed or implemented by the government in the oPt, as burn injuries are not a priority in the national agenda. In order for a national burn strategy in the oPt to become a reality, the issue of burns needs to be prioritised in national policymaking. This could be achieved through concerted efforts by decision makers to promote multi-sectoral prevention strategies by the MoH, MoEd, civil defence officials, health NGOs, donor organisations, United Nations agencies including UNRWA, in addition to universities, academics, and the private sector. The needs of residents living in either refugee camps, rural or urban settings in the oPt should be well explored, and they should be engaged and integrated in planning for such national prevention strategies.

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## CONFLICT OF INTEREST

The authors declare that they have no conflict of interest.

## DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

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