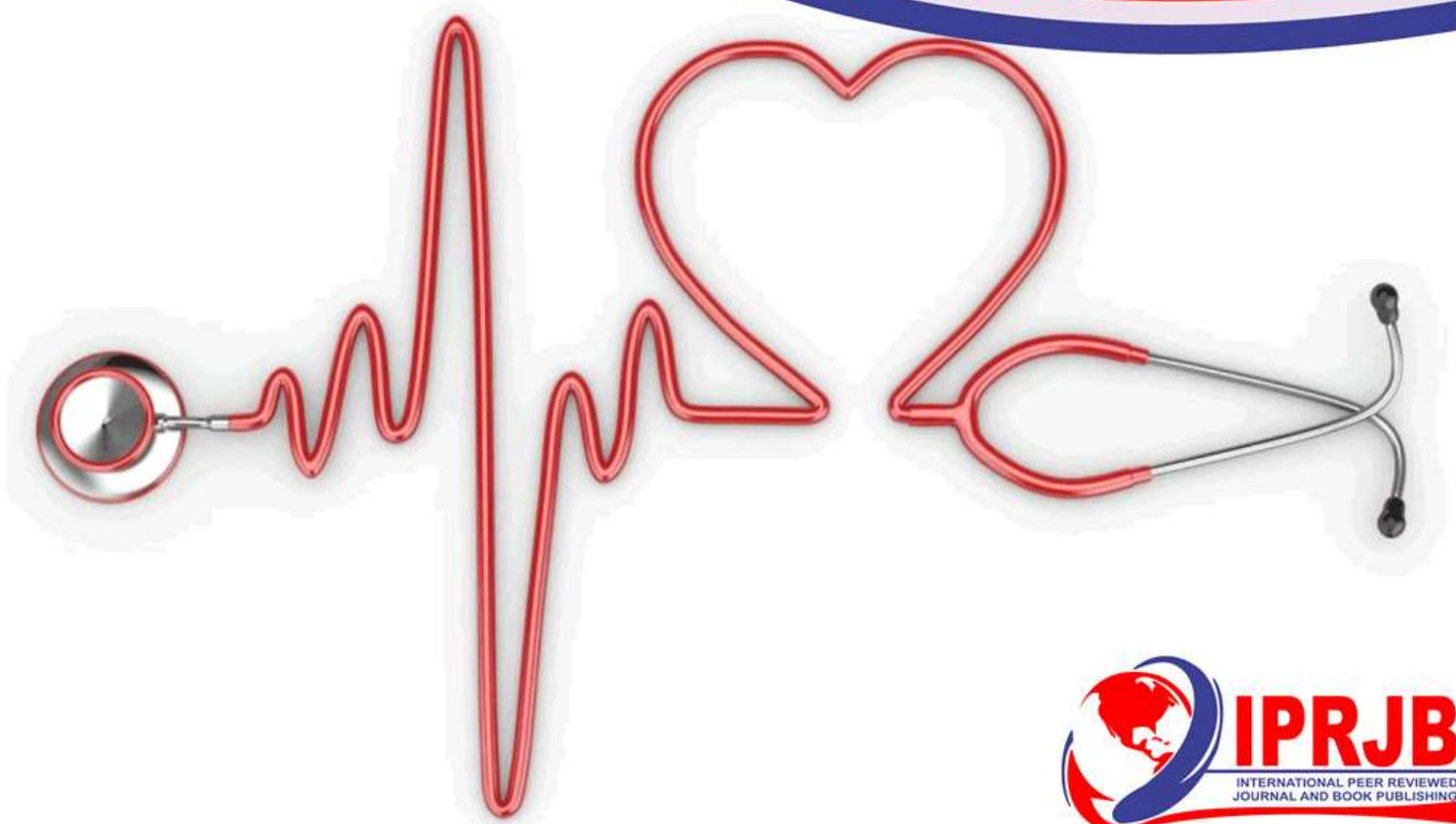


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Children's Burn Injury Prevention Program in Use in Addis Ababa, Ethiopia

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Children's Burn Injury Prevention Program in Use in Addis Ababa, Ethiopia



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Abstract

Purpose: Burn injury is one of the most common injuries among children and is associated with a high risk of mortality and morbidity. In low-resource settings, where preventive initiatives are limited, 90% of burn-related deaths occur. Consistent and reliable data are essential for effective and efficient burn injury prevention programs. We aimed to assess the current childhood burn injury prevention practices in use in Addis Ababa. The aim of the study was to assess the current children's burn injury prevention program in use in Addis Ababa.

Methodology: A qualitative exploratory study was conducted in September 2023. The investigator conducted four qualitative interviews with key informants, including a federal representative (n = 1), a senior burn unit manager (n = 1), a parastatal organization representative (n = 1), and a community leader (n = 1) in Addis Ababa. Participants were selected using a purposive non-random sampling strategy.

Findings: Four categories (prevention, responsible office for burns, capacity-building training, and communication) and ten subcategories emerged from the data, with community involvement, law enforcement, and motivation identified as major themes. Health workers advised caregivers to pay attention to their children and avoid leaving children unattended at home. Furthermore, the study showed that only the Addis Ababa Fire Brigade has a scheduled school- and community-based burn prevention education program in Addis Ababa.

Unique Contribution to Theory, Practice and Policy: Burn injuries can be prevented through appropriate preventive practices. Health workers at the burn unit contribute to prevention efforts through caregiver education aimed at reducing future burns and related complications. Communication activities, including mass media approaches, can support community awareness. The findings highlight the importance of strengthening existing burn prevention activities and community involvement in Addis Ababa.

Keywords: Burn, Children, Prevention, Health Policy, Addis Ababa, Ethiopia

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INTRODUCTION

Burn injuries were thought to be preventable but are still a prevalent global health problem, especially in low- and middle-income countries, including Ethiopia (Hyder et al., 2004; Deneke et al., 2021). Over 300,000 people lose their lives to burn injuries sustained in fires every year. Millions more endure disfigurements and disabilities brought on by burns (Peck et al., 2009, Adane et al., 2018, WHO, 2023). In sub-Saharan Africa alone, it is estimated that between 18,000 and 30,000 children younger than the age of five years die annually due to burn-related injuries (WHO, 2020, Mulatu, et al., 2022). A community survey conducted in Ethiopia and Bangladesh showed that 80-90% of burns sustained by children occur at home (WHO, 2022). Infants, toddlers and preschoolers are the highest risk group for burn injuries. However, to date, this population has been largely neglected (De Young, et al., 2012). Organized burn care is possible in high-income countries because there is direct or indirect involvement of the government, universal health insurance coverage, legislation like the right to health in place, and a high level of public safety awareness (Gupta et al., 1993, Museru, 1999, Teshale and Alemu 2017,). Such organized burn care does not exist in low-income countries compared to High-income countries (Hyder et al., 2004, Gupta et al., 2010, Tadele 2014, Geberabe, et al., 2019). The possible explanation for this gap could be the allocation of skilled manpower and resources to infectious and communicable diseases in Africa. However, with limited infrastructure and limited resources, few African countries are conducting and implementing burn prevention programs in the community, such as South Africa, Uganda, and Kenya (Teshale and Alemu, 2017, Potokar, 2019). According to the WHO (2022) report, burn injuries are the fifth most common cause of non-fatal childhood injuries. Africa and South-East Asia have a disproportionately high rate of burn injuries (Potokar, 2019, WHO, 2020). The present study aimed to assess and report on the current child burn injury prevention practices in use in Addis Ababa.

Research Question

What is the current child burn injury prevention practice in use in Addis Ababa?

LITERATURE REVIEW

Burn injuries are a global public health problem; fortunately, they are preventable. This has been demonstrated by the considerable progress made by high-income countries in their burn prevention strategies, such as Australia, Canada, the United Kingdom, and New Zealand (Wainjeri et al., 2019). Cooking-related child burn injuries cause a greater health burden in low- and middle-income countries (Adane et al., 2023). Low- and middle-income countries tend to focus on treatment, with little or no funding allowed for injury prevention and research (Potokar 2016). But treatment of burn injuries is expensive, which is why policies and legislation need to be developed to reduce the prevalence and incidence of burn injuries (Wainjeri et al., 2019, Price et al., 2021). Studies targeting households can result in the identification of risk factors operating in family setups (Wesson et al., 2013; Wainjeri et al., 2019). Previous burn-related injury experiences in the family are associated with an elevated risk of causing burn injuries. Risk factors for burn injury differ according to region, but typically include alcohol and smoking, the use of open fires for space or room heating, the use of a ground-level stove for cooking, the wearing of long, loose-fitting clothing while cooking, high set temperatures in hot water heating, and

substandard electrical wiring. Many of these risk factors are eminently amenable to prevention efforts (Mock et al., 2008). Prevention is key, and truly, the best way to treat a burn is to prevent it from happening in the first place (Biru et al., 2020). Effective preventions will face similar barriers to implementation as those efforts to improve acute care, but prevention is much more cost-effective and will clearly reach greater numbers of people (Peck, et al., 2009). The prevention of burn injuries can be effectively achieved by educating parents about safety measures and improving health infrastructure. (Price et al., 2021, Shahid et al., 2022, Gete et al., 2022). It is sad to notice that well-managed burn injury prevention measures are available in high-income countries (HICs), but scanty information on prevention strategies in low-income countries (LICs), including Ethiopia. The study conducted in Ethiopia by Nega et al (2002), Gate et al., (2022) in Addis Ababa indicates that there are no efficient and impactful burn injury prevention measures in use in Addis Ababa compared to HIC's. The current existing literature fails to account for the level and extent of burn injuries related to inflammable liquids such as petrol and kerosene in Addis Ababa. The study conducted in southern Nigeria by Bassey et al. (2022) shows from sixty-seven children with burn injuries, kerosene explosion burn was accounted for about 90% of all flame injuries. A systematic review published in (2015) highlighted that the implementation and evaluation of burn prevention programs have been limited in LMICs (Price et al., 2021). It is estimated that 250 per 10,000 children aged 0 – 4 are hospitalized for a burn injury in Western Australia (McGarry et al., 2013). The systematic review on epidemiology of burn injuries conducted in the Eastern Mediterranean region by Othman and Kendrick, in 2010, highlighted that the incidence of burn injury ranged from 112 to 518 per 100,000 per year whereas there is a paucity of data on the epidemiology of burn injury in Africa (AlAbabuker, et al., 2023,) The true prevalence of burn injury is not possible to determine in Africa. The possible explanation could be that some people still use traditional medicine for burn wounds, and they do not report the injury to the health facilities, although it is overshadowed by the overwhelming burden of infectious diseases, such as tuberculosis and malaria in these regions (AlAbubbakar et al.,2023).

Conceptual Framework

Burn injury has been correlated with the age of the children, comorbidity, illiteracy, and low socioeconomic status of the family. Each of these is a contributing factor to burn injury. The Ottawa Charter for health promotion outlines specific conditions necessary for attaining optimal health and reducing impairment. Five key action areas in Health Promotion (build healthy public policy, create supportive environments for health, strengthen community action for health, develop personal skills, and re-orient health services) and three basic Health promotion strategies were established such as (to advocate, to mediate and to enable,). To accomplish this, three fundamental strategies for promoting health would be a health advocacy. The objective is to minimize impairments and infectious diseases and to optimize health conditions as much as possible through public advocacy. Mediation, which means that health prospects cannot be guaranteed solely by the healthcare sector, involves collaboration with voluntary and non-governmental organizations, as well as engaging media sectors to create and facilitate a public education forum aimed at increasing injury awareness within the community (WHO,1986). The last strategy is to enable the community by helping it reach its full health potential through capacity-building training. It is important to ensure the availability of equal opportunities and resources for all. The cause and cost of burn injury treatment can be minimized or intervened in

by increasing awareness of the prevention strategies, improving the infrastructure and skilled manpower, and applying burn injury risk reduction strategies (Figure 1). The Ottawa Model of health promotion.

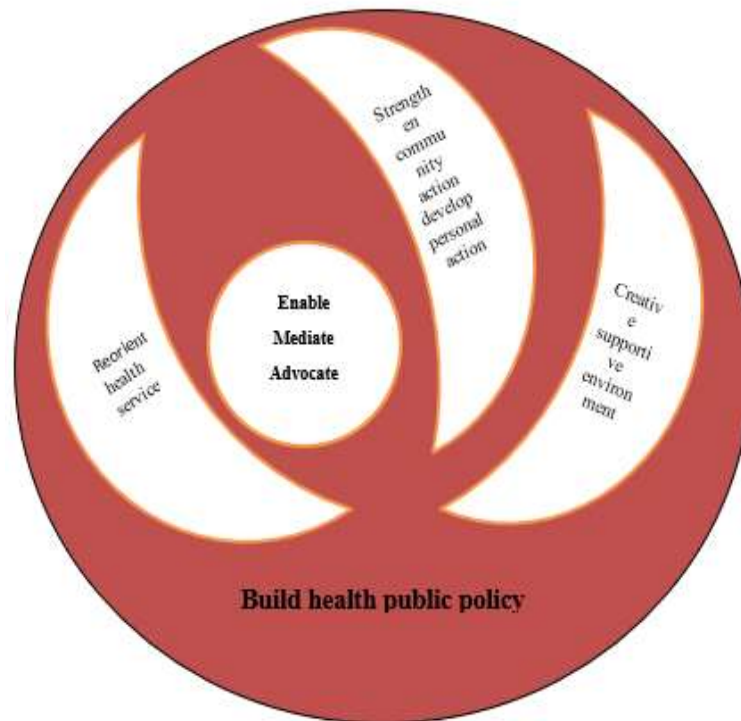


Figure 1: Ottawa Model of Health Promotion (WHO, 1986)

Source: Online <https://www.who.int/teams/health-promotion/enhanced-wellbeing/first-global-conference/call-for-action>.

Research Gaps

Literature concerning highly effective burn injury prevention programs in Africa is scarce (Peck, 2016, Gate et al., 2022). Further research is needed to investigate the challenges and facilitating factors in implementing established, effective burn injury prevention strategies, such as home safety education, particularly concerning the availability of safety equipment. Properly conducted observational research is necessary. This need led the researcher to initiate this study in Addis Ababa, aiming to gather foundational data for the city's burn injury prevention initiative.

METHODOLOGY

The qualitative study explores more detailed information from the key informants. In this study, categories are developed using content analysis, in which similar portions of text are ordered or placed proximally. They are separated from the interview or document itself; they are positioned so that statement after statement of the same thing may be examined, and the major commonalities

may be identified, coded, explicated, and described (Creswell, 2013; Janice, 2023). In September 2023, the researchers conducted four qualitative interviews with key informants, including a government representative (n = 1), a senior burn unit manager (n = 1), a parastatal organization (n = 1), and a community leader (n = 1). The study used a qualitative content analysis approach, until saturation was reached, the interviews went on. Interviews lasted approximately 45 to 60 minutes. Thematic content analysis was used to record, transcribe, and code categories, and subcategories.

Aim of the Study

To identify children, burn injury prevention is in use in Addis Ababa.

Objectives of the Study

To assess the current children's, burn injury prevention practice in use in Addis Ababa.

Study Design

This study had an explorative, qualitative approach. Interviews were conducted to obtain relevant information. This was considered to best fit the study; hence, it was work-related experiences and observation by community members.

Source of the Population

The program officer working at the above-selected hospitals and the desk officer working with children at burn injury prevention-related activities were the sources of the population.

Study Population

The determination of the sample size was based on the literature (Creswell, 2013), which suggests that the goal of a qualitative study is to gather comprehensive, thorough data about every issue rather than to examine a small number of people or sites. One or two people will supply sufficient information for narrative research (Creswell, 2013). The study's objectives dictated the sample size. In this study, the selection of key informants was based on the availability of senior community leaders and government representatives with expertise in burn prevention initiatives. Purposeful sampling strategies were used to choose the sample size. Four voluntarily agreed participants who are residents of Addis Ababa were selected for this study.

Study Setting

The interviews were conducted at a multi-centre in Addis Ababa, namely, the Ministry of Health headquarters, the Addis Ababa fire brigade prevention desk, and Addis Ababa burn, emergency and Trauma Hospital (AaBET) burn unit.

Instrumentation

Interview guide, voice recorder, and field notes.

Sample Size

The study used a purposive, non-random sampling strategy since there is no hypothesis being tested and no associated level of confidence in any test result in this study (Safamejad, et al., 2018). The participants were selected through personal contacts based on criteria of availability and subject matter knowledge of prevention. A total of three officers dealing with burn injury

prevention and one community leader from Addis Ababa were selected (Table 1). One officer from each facility, namely from the Addis Ababa fire brigade prevention desk, the AaBET hospital burn unit, and the Ministry of Health Injury Prevention Division. The term ‘key informant’ refers to a person who can provide detailed information and opinion on a particular subject based on his or her knowledge of this particular issue (Creswell, 2013).

Procedure

Verbal and written information about the study was given to each potential key informant. Participation was voluntary, and the respondents were informed that they could withdraw from the study at any time. All information was treated confidentially. Individual verbal and written consent were obtained from the participants at the beginning of each interview and voice recording. An interview guide with closed-ended and open-ended questions was used. There was flexibility in the interview guide to offer space for key informants to raise other issues that they might consider to be pertinent. All interviews were conducted in the Amharic language.

Ethical Consideration

For the use of information, consent to anonymity was obtained from the participants before conducting the interviews.

Data Analysis

The data was analysed using qualitative content analysis. Hierarchy Content analysis uses a descriptive approach in both the coding of the data and its interpretation of qualitative counts of the data (Morgan.,1993, Creswell., 2013). The recorded interviews and field notes were transcribed and then analysed manually using content analysis. Codes were identified. The codes were sorted into subcategories, and subsequently, the categories were exposed or identified (Janice , 2023).

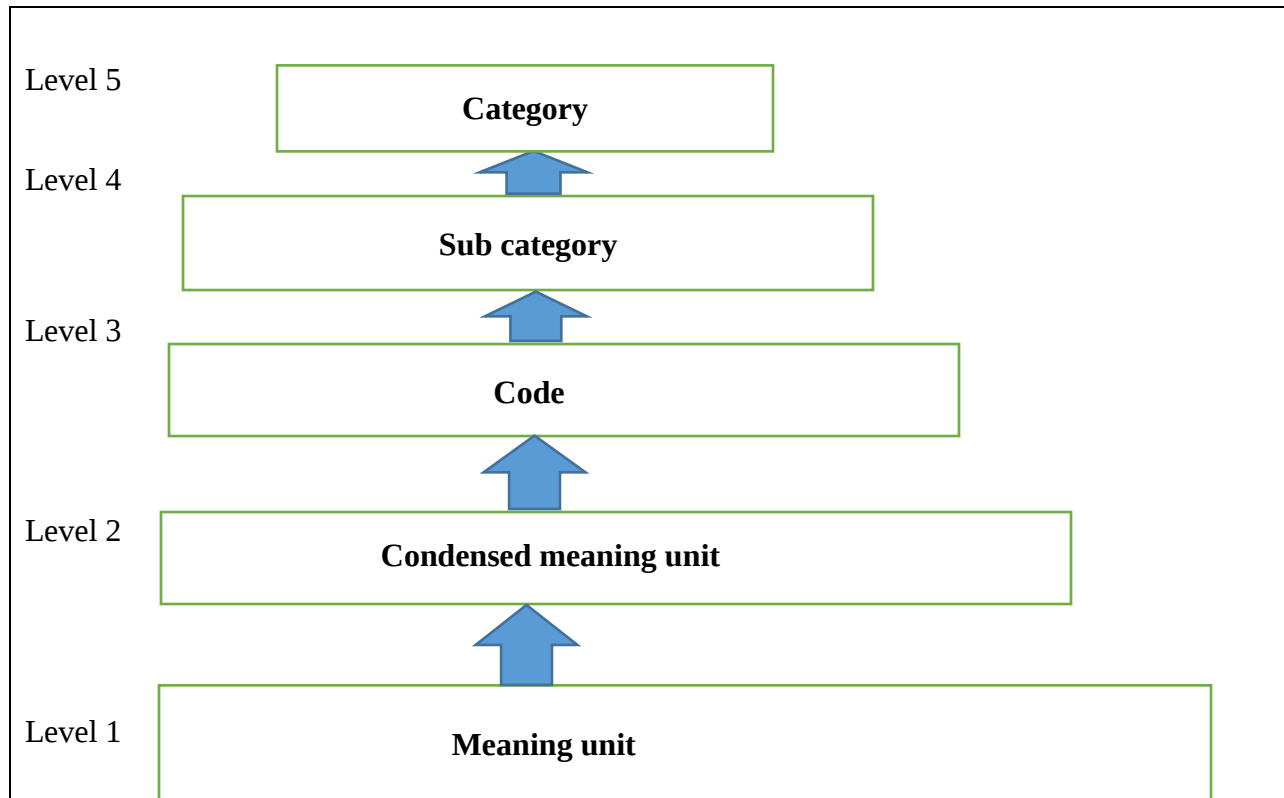


Figure 2: Qualitative Content Analysis Hierarchy

Characteristics of the Participants

The table below explains the composition and characteristics of the key informants who participated in the research.

Table 1: Characteristics of the Participants of the Key Informants on Burn Prevention (n=4)

Participant #	Name	Age	Sex	Position	Number of years in service
1	Participant 1	45	F	Burn unit head	8years
2	Participant 2	34	M	Injury prevention head	5years
3	Participant3	42	F	Burn injury prevention head	5 years
4	Participant 4	50	M	Faith-based organization in Addis Ababa.	10 years

Statement of the Participants

The table below shows the statement of each participant who participated in a burn prevention study.

Table 2: Statement of the Participants (n=4)

Case # & Gender	Meaning unit	Condensed meaning	Code	Subcategory	Category
1(F)	“You know “Some of the house was built in a risky area for flood and fire accident in Addis Ababa near to the river and no passage in time of emergency like fire. The organization has a school program that is conducted in schools and women's associations. The challenges are the law enforcement agency is unable to control those who sell the inflammable liquid next to the roadside for the motorists, mostly in the rural area of Addis Ababa...”	Risk for fire and flood next to the river house built. Educational program in school and women association Poor law enforcement in the country regarding inflammable items	Fire Flood Education program Women association, Law enforcement, inflammable liquid. Money generating purpose	Fire Awareness raising Inflammable liquid Law enforcement	Burn prevention
2 (M)	Uh, at the ministry level we do not have a burn prevention program. However, it is under the injury prevention section we are working with other stakeholders and some non-governmental organizations working on prevention. We have established a road map for the implementation of prevention programs in the near future.	No prevention at the ministry level Working with stakeholders Developing road maps for the future	Accountability Prevention strategy Networking	No prevention program	Responsible office is necessary at ministry level to organize prevention at federal level.

3(F)	In our facility, “pause” we receive the burn injury patients from all over the country, and we teach them once a week, an awareness-raising education to our patient and caregivers. but I do not know if other burn care centre doing the same, may be! Yekatit 12 burn unit. We do not conduct outreach prevention program because of limited manpower in the unit.	Continue burn prevention awareness in the facility. No outreach services for the follow-up Shortage of skilled manpower at the unit to conduct outreach	Awareness on burn injury prevention Motivating other facilities	Transfer knowledge Motivational speech	Empowerment health workers
4 (M)	“Okay” I am the resident of Addis Ababa and lived for more than 10 years. Burns are a big problem in our neighbourhood. I remember once I was called to pray for a child affected with a burn injury... I heard only one time on the radio about prevention of the burn, it was a good message, and I encourage continuing such messages to the public regularly on mass media, involving the church and mosque leaders to support the program. Try to involve the police to control the illegal selling of petrol to motorists	Resident of Addis Ababa 10 years lived in the city Witnessed a burn injury One-time-only radio message on burn prevention. Involvement of others stake holder in prevention is necessary A law enforcement officer is to be involved	Resident Witnessed burn injury Radio message once Networking with others Law enforcement	Social media usage Networking with other organizations	Communication skills

RESULTS

The results of the study on the current burn prevention program in Addis Ababa are presented in the tables below.

Socio-demographic Data of Key Informant Participants

All the participants (100%) were from Addis Ababa. Regarding gender, both females (50%) and males (50%) are equally distributed and 75% of the participants were above 40 years old, and 25 were below 39 years old. All participants were 4 (100%) were married, and 3 (75 %) of the participants) had more than five years of working experience in the field of burn injury management and prevention-related areas.

Table 3: Socio-Demographic Data (n=4).

		Number	Percent (%)
Gender	Male	2	(50 %)
	Female	2	(50 %)
Age	Above 40 years	3	(75%)
	Below 39 years	1	(25%)
Resident	Addis Ababa	4	(100%)
	Outside Addis Ababa	0	(0%)
Marital status	Married	4	(100%)
	Not married	0	(0%)
Work experience	5 years	2	(50%)
	8 years	1	(25%)
	10 years	1	(25%)

Overview Results

In this study, during the analysis process, four major categories emerged from the data: prevention programs, responsible offices for burn injury prevention programs, empowering health workers, and community and communication strategies. Further subcategories were formed. The categories and subcategories are presented in Table 4 below.

Table 4: Overview of the result

Subcategories	Category
Fire hazard	Prevention / policy law enforcement
Inflammable liquid	
Law enforcement	
At head quarter	Responsible officer for burn prevention program
At the regional level	
At grass root level	
Training material	Empowering health workers and community
Motivational speech	
Use of social media	Communication
Networking strategies with government and non-government organizations working on burn prevention	

Prevention

A recurring subject when interviewing the key informant was a burn prevention program issue, both at the management level and the community leader level. This was considered a basic issue to minimize the level of disability and mortality among children and caregivers. Programs for prevention education are regarded as one element of the management of burn injuries.

Fire Hazard

Many of the respondents' responses highlighted the danger of fire to individuals and property damage. The implementation of a burn injury program reduces the damage. For this reason, capacity-building training is very important.

“In our facility, “pause” we receive the burn injury patient from all over the country and we teach them, once a week, an awareness-raising education to our patients and caregivers. But I do not know if other burn care centre doing the same, may be! Yekatit 12 burn unit.” (Participant #1). The information on the burn prevention program was limited, according to one of the participants.

Selling of Inflammable Liquid on the Street

According to the respondents' report, some of the participants raised concerns about the sale of inflammable liquids, such as gasoline or petrol, at official outlets in the town. This is a very dangerous substance because it easily ignites and causes extensive damage to property and human lives.

“The challenges are that the law enforcement agency is unable to control those who sell the inflammable liquid next to the roadside for motorists, mostly in the rural areas of Addis Ababa.” (Participant # 1)

This is one of the major issues that is difficult to control in the country because there is no regulatory or accountable functional office in the regional state during the compiling of this report.

Law Enforcement

During the discussion, the issue of poor management of law enforcement emerged many times. And it was also a concern for the health workers because people can easily get access to buying gasoline or petrol from the street.

“The challenges are that the law enforcement agency is unable to control those who sell the inflammable liquid next to the roadside for motorists, mostly in rural areas of Addis” (participant #1 participant #2)

“..... I encourage continuing such a message to the public regularly, involving the church and mosque leaders to support the program. Try to involve the police to control the illegal selling of petrol to the motorist (participant # 4)

The participants highlighted that this is a very crucial issue because getting access to highly combustible liquid is very dangerous. Therefore, all government and non-government organizations must work together to minimize the danger.

The Availability of a Responsible Officer for the Burn Prevention Program

During the interviews, one of the interviewees mentioned that there was no burn prevention program separate from other injury programs, but it was under the injury prevention program at the health ministry level.

“Uh, at the ministry level, we do not have a burn prevention program; however, it is under the injury prevention section” (participant # 2)

This is common in the regional office and at the wereda level in Addis Ababa. No specific, effective, and functional office deals with burn prevention programs in Addis Ababa government settings.

Empowering Health Workers

One of the highlights of the interview was that teaching on burn prevention at the health facility was not regularly conducted due to the limited staff with knowledge of burn prevention education and shortage of manpower.

“In our facility, “pause” we receive the burn injury patient from all over the country and we teach them once in week an awareness-raising education to our patient and caregivers. but I do not know if other burn care centre doing the same, may be! Yekatit 12 burn unit. We do not conduct outreach prevention programs because of limited manpower in the unit”
participant #3.

Communication

During the interview, it was observed that one of the interviewees emphasized the significance of the dissemination of information on burn injury prevention using social media. It was suggested to use social media or mass media channels to raise awareness about burn injury avoidance at home environment.

“I do not know, but it is very good to use radio, television and social media to reach many people in our city and neighbourhood. Burn injuries are always happening to children at home,” participant #4

Discussion

Burn injuries are a leading cause of morbidity and mortality, with the burden of disease being disproportionately higher in low- and middle-income countries (LMIC), Wiechman and Patterson.,2004, Peck.,2016, Price, et al.,2021, Rencken, et al.,2021,). This study was conducted in an effort to assess the current burn prevention practices in use in Addis Ababa. The results provided general information about Addis Ababa's burn prevention program. The burn prevention program has led to a significant reduction in morbidity and mortality among children with burn injuries in HICs compared to LICs (Price, et al.,2021).

This study identified four major gaps in relation to burn prevention activities in Addis Ababa that contributed to the incidence of burn injuries among children in the Ethiopian context. 1. The analysis of the key informant interviews indicated that there was no effective burn prevention program run by the government health department at the local and national levels, although the Addis Ababa fire brigade conducted a school burn prevention program that did not cover the whole

Addis Ababa's residents. A systematic review published in 2015 indicated that there was limited information on burn prevention program implementation and evaluation data in LMIC's (Peck.,2016, Price, et al., 2021; Al Ababuker et al.,2023). The attempt was made to get a sample of the burn prevention program from the burn unit centre in Addis Ababa, but it was unsuccessful. 2. Most of the key information highlighted the unlimited access for underage children to dangerous inflammable gases such as petrol and gasoline for sale. This indicates a clear gap in the management of inflammable substances in the city, particularly in the surrounding villages. The study conducted by Kennedy & Knapp (1997) indicates that 95% of male children sustained burn injuries caused by storing flammable substances, such as gasoline, at home. Another study conducted by Putril, et al., (2021) shows that petroleum gas-related burn injuries have increased over recent years and have become a public health issue in Indonesia, India, and China. There were no statistics on children's burn injuries with petroleum gas from Addis Ababa to Camper in other studies. 3. There was limited publicity or information dissemination on burn prevention in the mass media, such as prevention posters on highways, in schools, and at community gathering points. Prevention programs developed alongside target populations, health education and communication efforts can significantly enhance risk assessment and boost understanding, attitudes, and practices related to burn first aid in under-resourced areas (Mortada, et al., 2020, Bergeijk et al.,2025). 4. There were limited or no strategies for networking with community leaders and faith-based organizations to increase awareness of the burn prevention program. Thus, evidence-based, targeted, community-level, combined projects are necessary to drive forward burn prevention through specific environmental interventions and supplementary educational programs. Therefore, a burn prevention program could play a significant role in increasing burn prevention awareness in the community.

CONCLUSION AND RECOMMENDATION

Conclusion

The result of this study shows some highlights: the participants suggested four main areas, namely, the need to intensify burn prevention programs in the community, to strengthen law enforcement authority, and to develop networking strategies with government and non-government organizations working on burn and injury prevention, like the Addis Ababa Fire Brigade organization. Future interventions should consider these gaps and establish a targeted, simple, and effective burn injury prevention program. The Ottawa Health Promotion Model can help with benchmarking for future burn prevention programs in Addis Ababa.

Recommendation

It is recommended that policymakers consider and give priority to an effective, efficient, and sustainable burn prevention program in Addis Ababa. Stronger emergency and rescue control mechanisms, which contribute towards minimizing the extent and level of disability. Therefore, the following are suggested based on the study findings:

1. Capacity-building training for health workers, women's associations, and schoolchildren
2. Develop and set standard guidelines for monitoring and evaluating the prevention program and the burn injury response team regularly.

3. Establishing a fire-related emergency evacuation team and prevention strategies for mass casualties in Addis Ababa and beyond.
4. Creating a community burn injury prevention group to raise awareness and provide free smoke detectors for highly populated residential and business areas in Addis Ababa could play a role in burn injury prevention in the future.

Gaps and Limitations

Limited Exploration of Preventive Measures: While the study acknowledged the need for prevention, it did not sufficiently explore existing burn prevention initiatives or evaluate their effectiveness.

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Conflict of interest; None

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