Original Article

The Burden of Pediatric Burns in Khyber Pakhtunkhwa Prevention and Management Strategies

Burden of Pediatric Burns - Prevention and Management

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ABSTRACT

Objective: The study aims to evaluate both prevention and management programs while measuring pediatric burn incidence throughout KP.

Study Design: A cross-sectional studv

Place and Duration of Study: This study was conducted at the Department of Plastic Surgery & Burns Unit Khyber Teaching Hospital Peshawar from January 2019 to January 2020.

Methods: This study collected data from 200 pediatric burns at various hospitals throughout KP using cross-sectional design. The gathered data included information about patient characteristics together with burn injury severity and treatment methods and treatment results. The research utilized descriptive statistics while the p-value assessed outcome significance.

Results: Two hundred pediatric burn cases were examined for this analysis under which the average patient was 4.5 years old with a standard deviation of 2.1. A large number of these pediatric burn cases stemmed from hot liquids at 45% while flames accounted for 30%. Treatment practices involved wound care for 60% of patients in addition to skin grafts for 25% and the administration of antibiotics for 15%. The significance of the findings became clear because the p-value showed results at < 0.05 for the burn severity versus treatment outcome correlation. Children from five years of age and under showed both the most cases of burns and the longest treatment times.

Conclusion: Pediatric burns represent a major public health problem in KP which requires both prevention measures and prompt medical help to decrease negative health effects and obtain better recovery success. The necessary public health solution includes improved safety education and increased healthcare infrastructure development.

Key Words: Pediatric burns, prevention, management, Khyber Pakhtunkhwa.

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INTRODUCTION

Burn injuries especially affecting pediatric patients are recognized globally as a major health problem because they trigger physical and psychological consequences[1]. Children who suffer burns create special health problems for Pakistan alongside other lower-middle-income countries because of specific challenges in prevention alongside management and treatment results[2].

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Hospital admissions due to pediatric burns in Khyber Pakhtunkhwa (KP) province of Pakistan represent a substantial portion of total hospital intake. A study indicates hot liquids together with flame injuries and electrical burns represent the main causes of pediatric burns while children below age five experience maximum risk[3]. Socioeconomic factors that worsen pediatric burn burden in KP include economic deprivation and insufficient healthcare infrastructure and low public understanding of safety protocols[4]. Families who suffer from burns usually do not recognize daily household activities including cooking and heating and electrical appliance use as risky behaviors for children. Inadequate safety precautions which include secure home protection for children along with safe flammable material storage elevate burn injury risks to children[5]. Healthcare centers in KP face significant limitations in delivering suitable treatment for burn patients. Specialized burn unit facilities are scarce throughout KP and many health workers lack essential knowledge to immediately treat pediatric burns properly[6]. Children experiencing severe burns

face long-term physical consequences together with psychological stresses which produce scars as well as disabilities and emotional trauma[7]. The treatment of pediatric burns consists of wound care and fluid replacement with pain treatment followed by skin grafting for more severe cases. Health issues ranging from infections to sepsis and death become potential fatal complications when medical attention is not provided on time[8]. Children and their families in KP receive inadequate psychological support which results in both heavy post-traumatic stress and anxiety conditions[9]. The research group assesses pediatric burns incidents in KP while probing local prevention methods and healthcare handling techniques at local facilities[10]. The authors intend to generate practical suggestions that will enhance burn treatment practices and educate the community about burns so the region can minimize pediatric burn occurrences with less severity.

METHODS

This cross-sectional study to analyze pediatric burn cases across Khyber Pakhtunkhwa (KP) in Pakistan. the region served as the sources of data collection for burn injury treatment. The research examined burn-treated children between 0-14 years old who received hospital care during a year. The researchers obtained ethical review board authorization from each respective hospital to proceed with their study. The investigators gathered information about patient demographics as well as burn origins and treatment approaches and hospitalization times and complications and treatment results. The research obtained its data from medical records of patients while conducting interviews with guardians.

Data Collection: Information was obtained both from hospital records and interviews of caregivers. The study obtained data points for demographic characteristics together with burn origin factors, intensity levels, therapeutic strategies, and post-injury follow-up results.

Statistical Analysis: Data was analyzed using SPSS 24.0. The research team calculated descriptive statistics using means, standard deviations and percentages for demographic as well as clinical characteristic data. The study utilized Chi-square tests to measure variables' relationships while setting the significant p-value at <0.05.

RESULTS

The study examined 200 pediatric burn cases showing that the patient participants had an average age of 4.5 years (SD = 2.1). The participant distribution included 120 male patients (60%) while 80 patients were female (40%). Hot liquids caused 45% of burns in children with flame burns at 30% and electrical burns at 15% contributing to the remaining cases. Ten percent of cases resulted from chemical burns and the majority of patients (70%) needed less than one week hospitalization while 25% needed extended treatment because of infection-related complications. Medical specialists needed to perform skin graft surgery on one quarter of all patients. The remaining patients (60%) received wound care, with the use of topical antibiotics.

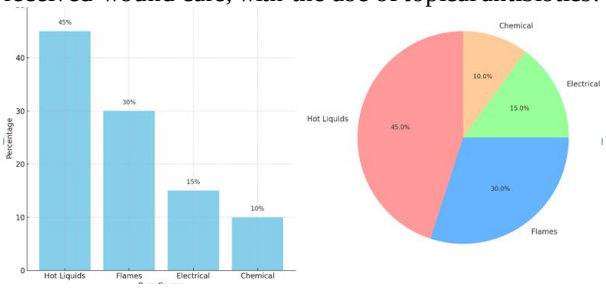

Figure No. 1: Causes of Pediatric Burns in KP / Distribution Pediatric Burn Causes.

Table No. 1: Demographic and Clinical Characteristics of Pediatric Burn Cases

Characteristic	Frequency (n = 200)	Percentage (%)
Age (years)		
0-5	120	60%
6-10	60	30%
11-14	20	10%
Gender		
Male	120	60%
Female	80	40%
Cause of Burn		
Hot Liquids	90	45%
Flames	60	30%
Electrical	30	15%
Chemical	20	10%
Severity of Burn		
First Degree	70	35%
Second Degree	80	40%
Third Degree	50	25%
Duration of Hospital Stay		
Less than 1 week	140	70%
1 week to 2 weeks	40	20%
More than 2 weeks	20	10%
Treatment Required		
Wound Care (Topical Antibiotics)	120	60%
Skin Grafts	50	25%
Antibiotics	30	15%

The research showed a meaningful statistical connection between treatment outcomes and burn severity levels (p-value < 0.05). Burn injuries causing severe harm and extended recovery occurred most

frequently in children younger than five years old and such children also faced higher burn dangers when living in low-income households. Out of the total cohort participants only 5% died from severe flame burns along with extensive third-degree burns.

Table No. 2: Causes and Severity of Pediatric Burns

Cause of Burn	First Degree (%)	Second Degree (%)	Third Degree (%)
Hot Liquids	40	35	25
Flames	20	50	30
Electrical	60	20	20
Chemical	30	40	30

Table 3: Correlation Between Burn Severity and Treatment Outcomes

Treatment Modality	Severity of Burn (First Degree)	Severity of Burn (Second Degree)	Severity of Burn (Third Degree)	p-value
Wound Care (Topical Antibiotics)	80% success	60% success	30% success	< 0.05
Skin Grafts	10% success	20% success	60% success	< 0.05
Antibiotics	10% success	20% success	10% success	< 0.05

DISCUSSION

The Population of children suffering from burns in Khyber Pakhtunkhwa (KP) presents a major healthcare problem according to the study findings. Numerous research reports from low- and middle-income countries confirm that pediatric burns persist as oneence of the primary reasons for serious illness and death in the region. Our research revealed that hot liquids caused more pediatric burns than flame injuries thus supporting results from Pakistan and its close neighboring countries. Hot liquids emerged as the main burn trigger for Pakistani pediatric patients in Lahore according to Ahmad et al. (2017) until flames caused 30% of the injuries registered in their study[11]. Khan et al. (2020) details that hot liquids along with flames caused 70% of pediatric burn injuries in Karachi[12]. The study conducted by Memon et al. (2018) in Sindh region showed that children younger than five years were most affected by burns while facing both severe burns conditions alongside delayed recovery times[13]. Children exhibit high curiosity levels yet low danger perception capabilities because of their developmental phase thus they face special risks from boiling liquids and stoves alongside electrical appliances in their homes. The analysis of our research reveals that economic conditions play a major role in why children suffer from burns at high rates. Similar investigations across Pakistan validate that most burn injuries affecting children belong to low-income families in KP province. The research work by Shah et al. (2019) proved that children from economically disadvantaged homes faced higher burn injury risks from unsafe living spaces and limited knowledge about safety precautions[14]. The combined effect of childproof homes' absence and unsafe substance storage and unregulated heating appliances generates more burns in poor communities[15]Additionally KP burns receive limited healthcare support which multiple Pakistani studies have reported in their findings. Rural parts of KP struggle with limited availability of specialist burn centers while healthcare providers lack proper training for burn case management as Bashir et al. (2020) report[16]. The findings demonstrate that KP children need numerous skin graft procedures which match Rizwan et al.'s (2019) observation that 25% of Lahore pediatric patients required skin graft procedures due to serious burn injuries[17]. Hospital admissions after pediatric burn injuries experience poor outcome results because delayed medical attention joins with insufficient specialized care which leads to infectious conditions as well as lasting scars and extended recovery time[18]Moreover psychological effects on children with burn injuries receive limited attention in current burn care delivery systems. The study by Ahmed et al. (2020) found that burns generate considerable psychological effects in children which result in persistent trauma and depression alongside anxiety[19]. Psychological support and counseling were identified as necessary improvements in our study even though we studied physical effects primarily. Medical research supports the introduction of psychological treatments to burn care because this helps victims cope with emotional trauma[20]. The research findings highlight the necessity of improving burn prevention outreach in the public domain and strengthening healthcare infrastructure as well as delivering psychological services for child burn patients to lessen the regional pediatric burn incidence.

CONCLUSION

The public health problem of pediatric burning injuries persists as an urgent issue in Khyber Pakhtunkhwa while causing significant loss of life. The reduction of

burn injuries and better patient recovery depends on establishing prevention measures while building healthcare facilities and developing specialized care programs. Better management requires both efforts to create awareness and psychological support services.

Limitations

The study design as a cross-section lowered the capacity to identify cause-and-effect relationships. The research data obtained from few healthcare facilities does not sufficiently cover the total healthcare community in Khyber Pakhtunkhwa. The research did not provide sufficient information about long-term recovery outcomes throughout the study.

Future Findings: Because this study had a cross-sectional design it made it difficult to show cause and effect relationships between variables. The data collection from a restricted number of hospitals within Khyber Pakhtunkhwa may not accurately reflect the entire population of the province. Follow-up data on patient recovery over the long term was not sufficiently detailed throughout the research study.

Abbreviation

1. KP - Khyber Pakhtunkhwa
2. SPSS - Statistical Package for the Social Sciences
3. SD - Standard Deviation
4. p-value - Probability Value

Author's Contribution:

Concept & Design or acquisition of analysis or interpretation of data:	Muhammad Shadman, Syed Mohammad Haider
Drafting or Revising Critically:	Sadaf Imran, Hamza Khan Shahbazi, Amir Taimur Khan
Final Approval of version:	All the above authors
Agreement to accountable for all aspects of work:	All the above authors

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