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Research Article

**SOCIO-DEMOGRAPHIC DETERMINANTS OF BURN
PATIENTS, ADMITTED IN BURN UNIT OF AYUB TEACHING
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Abstract:

BACKGROUND: Burns are destructive injuries that affect people out of proportion in developing countries. The aim of our study was to know about the socio-demographic determinants of burn patients, admitted in burn unit of Ayub Teaching Hospital Abbottabad.

METHODS: A cross-sectional study was carried out in burn unit of Ayub teaching hospital, in which sample of 84 patients was taken through non probability convenient sampling technique. Data was collected using a structured questionnaire by participants. The questionnaire was pre tested before adopting a final version. Informed consent was taken from all patients. Confidentiality of data was ensured. Data was analyzed using IBM SPSS 23.0.

RESULTS: Mean age of patients was 16.82 ± 14.902 years. Age of patients was in range of 1 to 65 years. Regarding gender distribution, 47 patients (56.0%) were males and 37 patients (44.0%) were females. Among the sample of 84, 56 patients (66.7%) were from rural area and 28 (33.3%) were from urban area. Regarding the cause of injury, 82 (97.6%) injuries were accidental, 2(2.4%) were homicidal. According to the distribution of place, 62 patients (73.8%) received burn injuries at home. The maximum of patients 34 (40.5%) were having flame burn.

CONCLUSIONS: From our study, we conclude that maximum cases of burns in burn unit of Ayub teaching hospital occurred in domestic areas and were accidental in origin. Burns due to fire were the most common occurring mostly in low socioeconomic, younger and uneducated population.

KEYWORDS: Socio demographic determinants, burn injuries, educational status, developing country.

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INTRODUCTION:

Burn is defined as an injury to the skin or other organic tissue which is mainly caused by heat or due to radiation, electricity, friction, and radioactivity or in contact with chemicals. Thermal burns occur when some or all of the cells in the skin or other tissues are damaged by hot liquids, hot solids, or flames.¹ There are four kinds of burn injuries based on the extent of skin involved. First-degree burns are burns which are limited to the top layer of skin only. It is also called as superficial burns. Second-degree burns are the injuries which cause blistering and involve deeper layers of the skin. It is also termed as a partial thickness burn injury. Third degree burns involve all the layers of skin, including the nerve innervations of skin. It is also called as full- thickness burns. Fourth-degree burns involve the underlying muscle beneath the skin.² In Canada, the approximate numbers of burn victims and deaths in serious cases are proportionally smaller as compared to third world countries.³ In a developing country like Pakistan the incidence of burns is quite striking, according to the WHO, the incidence of burns in Pakistan amounts to 1388/100,000 per annum as compared to global incidence of 110/100,000 per annum.⁴ Burn management is not only costly but is also a source of intimate trauma to the patient and his/her family. In Iran it was implicated that among the domestic injuries, burns are a major public health problem for women of reproductive age.⁵ Fortunately, in past few decades, the fatalities resulting from burn injuries have plummeted. This improved outcome is attributed to the proper management of burn patients with techniques like fluid resuscitation, pulmonary care, nutritional support, and wound care and infection control. As a result the statistics of burn related deaths show 50% decrease in mortality within the past 40 years.⁶ Pakistan being a developing country is under immense threat of increased burn injuries. Khyber Pakhtunkhwa is also suffering from frightening rate of burn injuries. Because Hazara is one of the biggest division of KPK and Ayub teaching hospital is the only tertiary care hospital in

Hazara division so, an overview of sociodemographic status in burn patients attending ATH will give us better view of understanding of sociodemographic status of burn patients in KPK. The aim of our study was to determine socio demographic determinants of burn patients that will help to design and plan preventive measures in order to decrease the incidence of burn injuries.

MATERIAL AND METHODS:

A cross sectional study was performed on all burn patients admitted in the burn unit of Ayub Teaching Hospital Abbottabad between December 2016 and July 2017. Patients were divided in to upper class, middle and lower class depending upon whether the patient monthly salary was above 30000Rs, between 15000 and 30000Rs and below 15000Rs respectively. Similarly, those who can write his name and can read Holy Quran were considered as educated and those who could not were considered as uneducated. Likewise, sample was also categorized into urban area and rural area depending upon those who lived in places like municipal corporation, municipal area committee and cantonment board or not respectively. A structured questionnaire was developed including several variables of interest. The questionnaire was pre-tested before giving final version. Interview based questionnaire was filled after taking informed consent from all the subjects. The completed questionnaires were entered into the computer using IBM SPSS version 23.0. Data were described in terms of frequencies and percentages for categorical variables. Continuous variables were described in terms of Mean + SD. Data was presented in the form of tables and figures.

RESULTS:

A sample of 84 patients was taken from burn unit of Ayub Teaching hospital Abbottabad. Minimum age was 1 year and Maximum age was 65 years. Mean age came out to be 16.82 ± 14.902 years. 29(34.52%) were of age less than five years, 24(28.57%) were of age 6 to 20 years old, 26(30.95%) were of age 21 to 40 years while 5(5.95%) were of age above 40.

Table 1: Gender of the patients.

Gender	Frequency	Percent
Male	47	56.0
Female	37	44.0
Total	84	100.0

The table shows a sample of 84 patients, 47(56.0%) patients were males and 37(44.0%) patients were females.

Table 2: Education of the patients

Educational status	Frequency	Percent
Educated	35	41.7
Uneducated	49	58.3
Total	84	100

The table shows a sample of 84 patients, 35(41.7%) patients were educated and 49 (58.3%) were not educated.

Table 3: Profession of the patients

Profession	Frequency	Percent
Government Employee	6	7.1
Private employee	5	6.0
Businessman	2	2.4
Jobless	4	4.8
Housewife	15	17.9
Student	12	14.3
Others	40	47.6
Total	84	100.0

In the data table of 84 patients, the majority of share (47.6%) is taken by patients who belonged to others profession followed with a big lag margin by housewives with a share of (17.6%) closely followed by patients who were students by profession with a percentage of (14.3%). The Government employees, Private employees, Jobless and Businessmen have the least contributions of (7.1%)(6%)(4.8%) an (2.4%) respectively.

Table 4 Marital status of the patients

Marital status	Frequency	Percent
Married	30	35.7
Unmarried	54	64.3
Total	84	100.0

The table shows a sample of 84 patients, 30 (35.7%) of patients were married and 54 (64.3%) were unmarried.

Table 5 Socioeconomic status of the patients

Socioeconomic status	Frequency	Percent
Upper class	11	13.1
Middle class	30	35.7
Lower class	43	51.2
Total	84	100.0

The table shows a sample of 84 patients, 11 patients (13.1%) came from upper class, 30 (35.7%) came from middle class and 43 (51.2%) came from lower class.

Table 6 Area of Residence of the patients.

Residence	Frequency	Percent
Rural	56	66.7
Urban	28	33.3
Total	84	100.0

The data table shows that out of total 84 patients, majority 56(66.7%) patients belonged to Rural areas while the urban ones were not trivial at the same time with 1/3rd of total 28(33.3%) patients presented during our study interval.

Table 7 Source of injury

Source of injury	Frequency	Percent
Fire	34	40.5
Electricity	17	20.2
Scalding	26	31.0
Chemicals	3	3.6
Others	4	4.8
Total	84	100.0

The data table shows that majority of patients presented with burns from Fire with total 34(40.5%) patients followed by patients with scald burns with (31%), Electric burns intermediate between the fire and scalds with (20.2%), Chemicals and burns due to other reasons were minimum with shares of (3.6%) and (4.8%) respectively.

Table 8 Place of injury

Place of injury	Frequency	Percent
Home	62	73.8
On route to somewhere	9	10.7
Work place	13	15.5
Total	84	100.0

The data table displays that the bulk of the burn incidents happened to patients at home with total 62(73.8%) presenting, incidents happened during work or on route to somewhere were small with percentages of (15.5%) and (10.7%) in order.

Table 9 Aim of injury

Aim of injury	Frequency	Percent
Accidental	82	97.6
Homicidal	2	2.4
Total	84	100.0

Table 10 Degree of Burns.

Degree of Burns	Frequency	Percent
Superficial	55	65.5
Deep	29	34.5
Total	84	100.0

The data table shows that among 84 patients, 2/3rd of patients 55(65.5%) suffered superficial burns and 1/3rd 29(34.5%) patients suffered deep burns.

Table 11 Surface area of burn

Surface area of burn	Frequency	Percent
less than 20%	43	51.2
20 to 35%	26	31.0
36 to 50%	12	14.3
above 50%	3	3.6
Total	84	100.0

Data table shows that almost half of the patients 43(51%) presented had their body surface areas affected less than 20% and 1/4th 26(31%) patients of total had body surface area affected between 20 and 35%. Only 12(14.3%) patients presented with involvement of 36-50% body surface area, 3(3.6%) patients had more than half of their body surface area involvement due to burns.

Table 12 Association of Gender with source of injury

Gender		Source of Injury					Total	P value
		Fire	Electricity	Scalding	Chemicals	Others		
Male	Count	18	13	10	3	3	47	0.06
	% within gender	38.3%	27.7%	21.3%	6.4%	6.4%	100.0%	
Female	Count	16	4	16	0	1	37	
	% within gender	43.2%	10.8%	43.2%	0.0%	2.7%	100.0%	
Total	Count	34	17	26	3	4	84	
	% within gender	40.5%	20.2%	31.0%	3.6%	4.8%	100.0%	

From the analysis of the above cross tabulation, we concluded that the frequency of burns was highest among both the males and females from fire related burns. Out of fire related burns 18(52.9%) were males and 16(47.05%) were females. This was opposite in case of burns related to electricity where the higher prevalence was found in males 13(76.47%) as compared to 4(23.52%) females. There is a two-fold high frequency of burns related to scalds in females than in males. There were minor counts of burns due to chemicals and others with none female patient presenting due to chemicals and only 3 male patients presenting due to chemicals and other burns. With a p-value of 0.06, this data was not found to be statistically significant.

Table 13 Association of area of residence with source of injury

Area of residence		Source of Injury					Total	P value
		Fire	Electricity	Scalding	Chemicals	Others		
Rural	Count	23	11	17	3	2	56	0.725
	% within area of residence	41.1%	19.6%	30.4%	5.4%	3.6%	100.0%	
Urban	Count	11	6	9	0	2	28	
	% within area of residence	39.3%	21.4%	32.1%	0.0%	7.1%	100.0%	
Total	Count	34	17	26	3	4	84	
	% within area of residence	40.5%	20.2%	31.0%	3.6%	4.8%	100.0%	

This table displays the relation of area of residence with the source of injury and we concluded that the frequency of burns related to fire were two times more in frequency in rural areas. Similarly injuries from electricity was two times more frequent in rural areas. Burns from scalding was also about two times more prevalent in rural areas. Chemical burns occurred only in rural areas. This data was not found to be statistically significant (p-value: 0.725).

Table 14 Association of age group with source of injury

Age groups		Source of Injury					Total	P value
		Fire	Electricity	Scalding	Chemicals	Others		
1 to 5 years	Count	7	3	18	0	1	29	0.018
	% within source	20.6%	17.6%	69.2%	0.0%	25.0%	34.5%	
6 to 20 years	Count	11	6	5	1	1	24	
	% within source	32.4%	35.3%	19.2%	33.3%	25.0%	28.6%	
21 to 40 years	Count	12	7	3	2	2	26	
	% within source	35.3%	41.2%	11.5%	66.7%	50.0%	31.0%	
above 40 years	Count	4	1	0	0	0	5	
	% within source	11.8%	5.9%	0.0%	0.0%	0.0%	6.0%	
Total	Count	34	17	26	3	4	84	
	% within source	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	

This cross tabulation shows that scalding was the most common source of injury in the patients of 1 to 5 years and the least common source of burns in the same age group patients was burns due to chemicals with none of the patients presented with burns due to chemicals. One of the striking feature we concluded was that burns due to chemicals were most common amongst the age group of 21 to 40 years (66.7%) followed by in age groups of 6 to 20 years (33.3%). Almost half of the cases presented with burns due to other causes belonged to the age groups of 21 to 40 years. This data was found to be statistically significant (p-value: 0.01).

DISCUSSION:

In this study important characteristics of patients of burn unit of Ayub Teaching Hospital are presented.

Most of the people used public transport as mode of transportation to get to the hospital. Fire was the most frequent cause of burns in this demographic followed by hot liquids with deaths resulted more than frequently from fire burn injuries. Male gender had higher prevalence than female in our study.

Our findings were different from the findings of others studies done in South Asia and Eastern Mediterranean demographic, where prevalence of patients suffering from burn injuries was lower in females.⁷ This contrast in data could be accredited to the low prevalence of reporting of females injuries as well as to delays in care seeking. For instance, there may be depreciation of presentation of females to hospital in this regard, especially if the burns were self-inflicted or had doubt of foul play.

Our findings also show that the incidence of burns was highest among patients under 5 years of age and young adults which support studies from India and China.⁸ This data also supports the WHO reviews of data of South-East Asia and Eastern-Mediterranean.⁹ Similar results, the higher prevalence of burns in low age patients, has also been reported in Pakistan, China, Iran, Turkey and India on local and national levels.¹⁰ However, from some other demographics like Oman and Bangladesh, the data collected showed higher incidence of burns in elderly population contrasting our findings.¹¹

Accurate assessment is required in young adults presenting as burn patients as these patients more often than less are sole earners of their families and thus present the issue of economic consequence. Flame burns and scalds were the highest recorded causes of burns, which supports the literature regarding this

topic from India, Iran, Pakistan, and the reviews form Eastern-Mediterranean Region.¹²

There is no data of the causative agent leading to fire or flame inflicting the burns. Though in previous studies in our demographic, kerosene oil, wood-base fuel and stove burners have been reported as the causes of starting the fires injuring the female population of Southeast Asia.¹²

There is lack of burn units in minor cities and rural areas. Abbottabad district, with population in millions, has just one public burn care center, located in Ayub Teaching Hospital. The rural areas are extremely deficient in burn care facilities, there aren't any efficient modes of referral either. People cannot refer to private facilities due to economic burden and have to avail what they can at public healthcare facilities.

Though lack of basic necessities is a major hurdle to the care of burn patients, some other contributing factors to this issue are the high population density, vast stretch of area covered by the hospital, poor educational and socioeconomic status of the population, lack of awareness concerning preventive measures and uses unapproved and inappropriate treatments like home-made remedies.¹³ The data in our study reflects the analysis of population presenting to the tertiary care facility of Ayub Teaching Hospital and is thus lacks the interpretation of potential data of those patients who stop at the lower level of healthcare system like a primary or secondary healthcare facilities. This study covered data regarding location, source, severity and degree of burns. These are the major factors which determine the morbidity and mortality of burn injury patients.⁴

CONCLUSION:

From the research findings, Majority of the cases were domestic and were accidental. Most common burns were from fires and were most frequently seen in people of uneducated, younger population (age less than 20 years) and lower socio economic groups.

Recommendations:

- Prevention of burns should be a higher priority than treatment.
- Safe practices regarding burn prevention like fire extinguishers and alarms should be enforced at work places.
- Home appliances and utilities should meet fire safety standards.
- People awareness about problems like burn injuries should be amplified.

- More healthcare units for burn patients should be created to distribute the burden and provide care for the patients.

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