CROSS SECTIONAL DEMOGRAPHIC STUDY OF BURNS IN A SUBURBAN TEACHING HOSPITAL

ABSTRACT

Background: Burn injuries rank among the most severe type of injury with high morbidity and mortality worldwide. Burn injuries not only affect their physical health but also affects their social and psychological well being along with severe economic loss to the individual, their family and to the society. About 90% burn injuries are preventable, but poor adherence of safety measures and awareness leads to disability and disfigurement throughout their life. Hence, the need for various demographic variables to understand the cause and pattern in our region are required.

Objectives: To study the demographic and socio-cultural aspects of burn patients and also to find out the cause of burn victims in our region and finally to conclude with the preventive aspects of burn injuries.

Materials and Methods: A record based cross-sectional study was conducted at Saveetha Medical College and Hospital, Thandalam, Kanchipuram district. The medical records of all patients over a period of 4 years (January 2017 to December 2020) were reviewed and 208 cases were studied. Data were recorded on pre-structured and pretested questionnaire. Chi-square test was done to study association between socio-demographic variables and burn injury. ($p<0.05$) was considered statistically significant.

Results: A total of 208 burn cases were involved in this study out of which 56.7% were females and 43.3% were males showing female predominance. Most of the burn patients belonged to 31-45 years and rural areas. Majority of burn injuries were accidental in nature and thermal burns was the commonest cause producing deep burns which was significant ($p<0.05$).

Conclusion: Socio-demographic factors are important in raising educational programs and awareness in rural areas for improving better quality of life.

Keywords: Burns injuries, Socio-demographic variables, mortality

INTRODUCTION

Burn injuries rank among the most severe type of injury with a high morbidity and mortality of victims worldwide.[1] In this contemporary world with many advances in medical care,

burns account for an estimated 1,80,000 deaths annually, existing as a global public health problem. In India, the second most populous country in the world, over 1,00,000 people are affected with burn injuries ranging from moderate to severe degrees of burns.[2] The most common cause for burn injury in Indian scenario is household injury.[3]

The outcome of the burn depends on factors like degree of burn, duration of exposure, total body surface area involved, type of injury, site, age, sex and co-morbidities. Furthermore, burn injuries and their sequelae are not limited to the physical health of patients but affect their social, and psychological well being along with severe economic loss to the individual, their family and to the society.[4] Also those who survive with disability and disfigurement usually live with stigma and rejection.[2] Burn injuries accounts for one among the main causes of disability-adjusted life-years (DALYs) lost in low- and middle-income families.[5] The rate of non-fatal childhood injury from burns is over 7 times higher in low- and middle-income families than in high-income families and the elderly population also remains at higher risk for burn injury.

According to National Program for Prevention of Burn Injuries, in a developing country like India burn care is more challenging due to inadequate medical facilities, poor adherence of fire safety measures due to lack of public awareness, illiteracy and poverty all of which have a significant impact on the burn care management. Above factors, if resolved, will prevent 90% of burn injuries.[6] Each year, a considerable proportion of deaths in India occur because of burn injuries. The aetiological factors of burn injuries differ substantially in different communities and regions and therefore the requirement for comprehensive epidemiological studies is needed before the planning and implementation of a sound prevention program.[7] The appropriate knowledge of the epidemiological factors and associated risk factors and a good practice of burn management can reduce the mortality and morbidity of burn patients.

This study was undertaken with objectives to study the demographic and socio-cultural aspects of burn patients and also to find out the cause of burn victims in Saveetha Medical College and Hospital and to conclude with the preventive aspects of burn injuries.

MATERIAL AND METHODS:

This is a record-based cross-sectional study conducted at Saveetha Medical College and Hospital, Thandalam, Kanchipuram district, which is a semi-urban area with heavy agricultural and industrial activities. The medical records of all the patients admitted to the burn ward of Plastic Surgery department over a period of 4 years (January 2017 - December 2020) were reviewed and 208 cases were involved in this study.

Approval from the Institutional Health Research Ethics Committee was obtained before the commencement of the study. Consent was obtained from Medical Superintendent of the hospital to see the case records. Data regarding socio-demographic profile of burn patients were recorded on pre-structured and pretested questionnaire. Epidemiological parameters like

age, sex, type of burn, total body surface area involved, degree and depth of burns were taken.

Characteristic	Frequency (N=208)	Percentage (%)
Age group (in years)		
<15	17	8.17%
16-30	57	27.4%
31-45	81	38.94%
46-60	35	16.8%
>60	18	8.65%
Gender		

All data were entered in MS EXCEL sheet and was analyzed using SPSS software package. Results were reported as percentages. Chi-square test was done to test the significance of association between socio-demographic variables and burn injury. ($P < 0.05$) was considered statistically significant.

RESULTS

A total of 208 burn cases were involved for this study. Out of the 208 patients (56.7%) were females and (43.3%) were males. Majority of the burn patients were between the age group of 31-45 years (38.94%) and higher risk groups accounts (8.17%) for less than 15 years and (8.65%) for elderly age group. Most of them belong to rural areas (63.94%) and others occupy adjacent semi-urban areas (36.05%). Around (55.7%) have floor arrangement of kitchen and (44.2%) use platform based kitchen as shown in [Figure:1]. Most of the burn patients were married (76.92%). Education level was grouped as illiterate, primary school, higher secondary and graduate. Out of these 208 injured burn patients, 29 (13.94%) were illiterate, 42 (20.19%) were of primary school level, 88 (42.3%) were of higher secondary level and 49 (23.5%) were graduates. Incidence of burn injuries is equally distributed in employed and unemployed groups. [Table:1]

Male	90	43.3%
Female	118	56.7%
Marital status		
Married	160	76.92%
Unmarried	48	23%
Occupation		
Employed	109	52.4%
Unemployed	99	47.5%
Residence		
Rural	133	63.94%
Semi-urban	75	36.05%
Arrangement of kitchen		
Floor	116	55.7%
Platform	92	44.2%
Education		
Illiterate	29	13.94%
Primary school	42	20.19%
Higher secondary	88	42.3%
Graduate	49	23.5%

Table 1:Demographic characteristics of burn victims

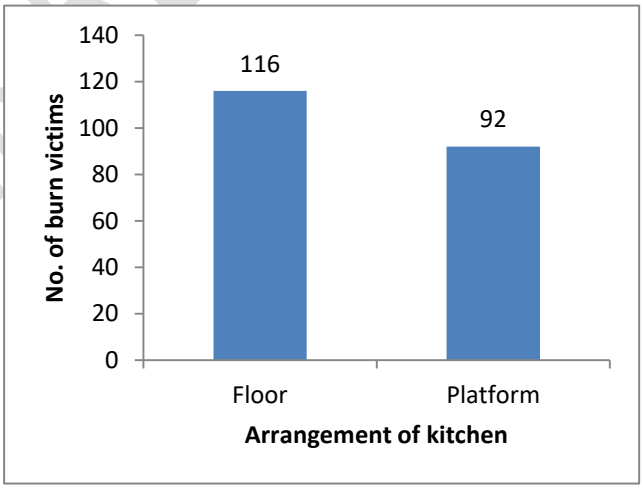

Figure 1: Arrangement of kitchen of burn victims

Majority of burns were accidental in nature (92.7%) compared to suicidal (5.3%) and homicidal burns (2%). Thermal burns was the common cause accounting for 49.51% of total burns, followed by scalds (19.2%), electrical (15%), contact (9.61%) and chemical burns (6.73%). Total body surface area (TBSA) involvement of burn were more for 11-20% group (36.05%) and were least for more than 40% group (2.9%) as shown in [Figure:2]. Among these TBSA burnt, 113 patients (54.3%) showed deep burns. Highest percentage of affected body area involved is upper limb (37.5%) followed by lower limb (26.92%), trunk (23.07%) and least for head and neck region (12.6%). Burn victims affected with head, neck and trunk injury suffer from respiratory burns. [Table:2]

Distribution	Frequency (N=208)	Percentage (%)

Nature of burn		
Accidental	193	92.7%
Homicidal	4	2%
Suicidal	11	5.3%
Depth of burn		
Superficial	95	45.67%
Deep	113	54.3%
Type of burn		
Chemical	14	6.73%
Electrical	31	15%
Thermal	103	49.51%
Scald	40	19.2%
Contact	20	9.61%
TBSA involvement (% of burn)		
<10	69	33.17%
11-20	75	36.05%
21-30	44	21.15%
31-40	14	6.73%
>40	6	2.9%
Affected body area		
Head and neck	26	12.5%
Trunk	48	23.07%
Upper limb	78	37.5%
Lower limb	56	26.92%

Table 2:Distribution of burn injuries according to nature, depth, type, TBSA burnt and affected body area

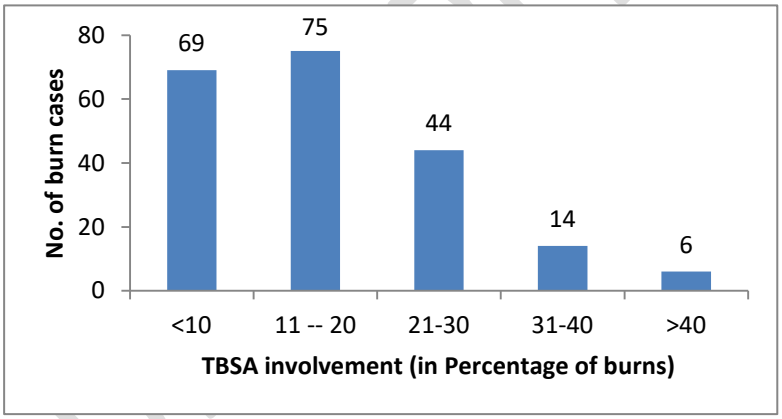

Figure 2: TBSA burn involvement of burn victims

In this study, while calculating chi-square to find out the association of TBSA burnt percentage among selected demographic variables, we found significant association between marital status, arrangement of kitchen, depth of burn (superficial and deep), nature of burn (accidental, homicidal and suicidal) and the type of burn involved (chemical, electrical, thermal, scalds and contact burns). No significant statistical difference was found between TBSA burnt and other socio-demographic variables as they share equal knowledge and awareness for burn injuries irrespective of their age groups, gender and residence.[Table:3]

Table 3:Association between TBSA burnt and socio-demographic variables

Socio-demographic variables	TBSA burnt		Total	P-value
	<25%	>25%		
Age groups (in years)				
<15	13	4	17	0.849
16-30	40	17	57	
31-45	58	23	81	
46-60	22	13	35	
>60	12	6	18	
Gender				
Male	65	25	90	0.97
Female	85	33	118	
Marital status				
Married	106	54	160	**0.001****
Unmarried	43	5	48	
Residence				
Rural	92	41	133	0.207
Semi-urban	58	17	75	
Arrangement of kitchen				
Floor	62	54	116	**0.0013****
Platform	69	23	92	
Depth of burn				
Superficial	83	12	95	**<0.00001****
Deep	66	47	113	
Nature of burn				
Accidental	145	48	193	**0.00015****
Homicidal	2	2	4	
Suicidal	2	9	11	
Type of burn				
Chemical	11	3	14	**0.0136****
Electrical	29	2	31	
Thermal	64	39	103	
Scald	30	10	40	
Contact	15	5	20	
****Statistically significant (p<0.05)**				

DISCUSSION

Burn injuries are among the most serious injuries and a major global public health hazard. Almost 95% of burn victims suffer with high morbidity and mortality. Burns are classified depending on the depth of injury. It is classified into three degrees. First degree: Superficial involving only epidermis; Second degree: is divided into Superficial partial thickness which involves upper dermis (papillary region) and Deep partial thickness involving lower dermis (reticular region); and Third degree: Full thickness involving subcutaneous structures that is hypodermis.[8]

Our retrospective study through the review of medical case records showing socio-demographic variables related to burn patients became helpful in prevention of burn injuries. Female predominance is more for burn injuries in our study.[9,10] Our data showed that the age group between 16 to 45 years is the most vulnerable to burn injuries for both genders.[11] Thus,

overall female subjects were at higher risk for burn injuries owing to their domestic chores and invariably using unsafe equipments at home.

In our study majority of burn victims had attained higher education which is in contrast to another study where majority of patients were illiterate.[12] Regarding marital status, most of the burn patients were married similar to another study.[13]

Most of the burn injuries were accidental in nature, which was consistent with other studies and thermal burns being the most commonest cause for burn injuries, because people especially in rural areas still use firewood, kerosene stoves for cooking and lamps at home owing to lack of electricity.[10,14,15] In our study, majority of people use floor based kitchen than platform based affecting females while cooking which is similar to another study.[9]

CONCLUSION

The current study gives important information for the need of educational programs in rural areas to provide them knowledge and awareness, thus helpful in reducing burden of burn injuries. First-Aid measures should be enabled especially for the people who still use firewood, kerosene stoves and liquid petroleum gas connection and their illiteracy status. Specialized burn care management in rural areas for burn injured people along with strict policies especially for women, will ensure their outcome and improve their quality of life.

REFERENCES

1. Atiyeh BS, Costagliola M, Hayek SN. Burn prevention mechanisms and outcomes: pitfalls, failures and successes. burns. 2009 Mar 1 and 35(2):181-93.

2.World Health Organization. Burns fact sheet. URL: http: //www. who.int /mediacentre /factsheets/fs365/en.

3. Sarma BP. Epidemiology, Morbidity, Mortality And Treatment In Burns-A Changing Scenario In Four Decades In The State Of Assam.

4. Rosenberg L, Rosenberg M, Rimmer RB, Fauerbach JA. Psychosocial recovery and reintegration of patients with burn injuries. InTotal burn care 2018 Jan 1 (pp. 709-720). Elsevier.

5. 1, Peck MD. Epidemiology of burns throughout the world. Part I: Distribution and risk factors. Burns. 2011 Nov and 37(7):1087-100.

6. Gupta JL, Makhija LK, Bajaj SP. National programme for prevention of burn injuries. Indian journal of plastic surgery. 2010 Sep and 01):S6-10., 43(S.

7. Jaiswal KA, Aggarwal H, Solanki P, Lubana PS, Mathur RK, Odiya S. Epidemiological and socio-cultural study of burn patients in MY Hospital, Indore, India. Indian Journal of Plastic Surgery. 2007 Jul and 40(02):158-63.

8. Evers LH, Bhavsar D, Mailänder P. The biology of burn injury. Experimental dermatology. 2010 Sep and 19(9):777-83.

9. Verma SK, Chaturvedi S, Gupta S. A sociodemographic profile and outcome of burn patients admitted in a tertiary-care hospital. International Journal of Medical Science and Public Health. 2016 Nov 1 and 5(11):2290.

10. Kumar M, Yasmin E, Kumar C, Kashyap V. Pattern of burn injury among patients admitted in a Tertiary Care Hospital of Jharkhand. International Journal of Community Medicine and Public Health. 2018 Jul and 5(7):3056-60.

11. Shankar G, Naik VA, Powar R. Epidemiological study of burn patients admitted in a District Hospital of North Karnataka, India. Indian Journal of Burns. 2014 Jan 1 and 22(1):83.

12. Lal P, Rahi M, Jain T, Ingle GK. Epidemiological study of burn injuries in a slum community of Delhi. Indian journal of community medicine. 2006 and 31(2):24-.

13. Shanmugakrishnan RR, Narayanan V, Thirumalaikolundusubramanian P. Epidemiology of burns in a teaching hospital in south India. Indian Journal of Plastic Surgery. 2008 Jan and 41(01):34-7.

14. Dash JK, Mohapatra I. An Epidemiological Study of Burns Patients Admitted in a Tertiary Care Hospital of Bhubaneswar, Odisha. Int J Health Sci Res. 2017 and 7(3):8-13.

15. Lami FH, Al Naser RK. Epidemiological characteristics of burn injuries in Iraq: A burn hospital-based study. Burns. 2019 Mar 1 and 45(2):479-83.