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Original Research Article

STUDY OF SOCIO-DEMOGRAPHIC FACTORS AND THEIR ASSOCIATION WITH GENDER AMONG BURN CASES AMONG ADMITTED BURN CASES AT A TERTIARY HOSPITAL

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ABSTRACT

Background: As India is developing country with growing economy, urbanization, industrialization, thus many lifestyle changes are being observed. The proportion of causes of burns are different depending on the different social, economical, geographical and cultural variations. Present Study was aimed to study socio-demographic factors and their association with gender among burn cases among admitted burn cases at a tertiary hospital.
Materials and Methods: Present study was Hospital based Cross-Sectional Study, conducted in all the burn cases that will be admitted to burn care unit.
Results: Out of 230 burn cases under study majority of the cases were observed in the age group 16-30yrs constituted 71(30.78%). There is a significant association between the age and gender among the burn patients. Majority of the burn patients were found to be females in the age group of 16-30yrs 32.54%. Out of 230 burn patients under study majority were indoor burns 171(74.35%), followed by outdoor burns 59(25.65%). Flame burns were found to be majorly occurring by stove flame 80(48.19%), followed by open flame 35(21.08%), kerosene 26(15.66%), inflammables 7.22%. Majority of the social factors effecting burns were found to be financial/economical problems (60.86%) followed by family conflicts (35.66%), family issues (34.34%), employment issues (24.34%) etc. Out of 230 burn cases 115 were married majority of them were accidental among both males and females but it was interesting to note that female 5(33.33%) cases out numbered males1(2.08%) in attempted homicidal with marital life <1yr. Flame burns were maximum in Indoor burns and indoor burns were found to be maximum among females and there was statistically significant association among them.
Conclusion: Majority of the burn patients belonged to reproductive age group, low socioeconomic status, females, illiterates or with primary school education.
Keywords: burns, social, economical, socio-demographic factors, gender

INTRODUCTION

As India is developing country with growing economy, urbanization, industrialization, thus many lifestyle changes are being observed. Burn injuries in various forms like domestic, occupational, commercial, chemical and road traffic burn injuries because of inflammables are at rise. Domestic burns are found to be predominantly observed in females. Commercial and occupational burns are predominantly observed in males. Flame burns are observed to be major of portion of total burn injuries.[1]

According to Indian Journal of Plastic Surgery the estimated annual incidence of burns is approximately 6-7 million.[2] Judicious exploration suggests a mortality of 1-1.4 lakhs annually. It is estimated that over one million are moderately or severely burnt every year in India. As per WHO report 2014 in India over 1,000,000 people are moderately or severely burnt. The high incidence is attributed to poverty, low level safety consciousness in the population.[3]

It was estimated that 90% of the burn injuries are preventable. An initiative at national level is need for more effective and standardized treatment delivery. Hence it had been important to carry out relevant studies in developing country as ours in order to observe the socio demographic factors association in causation of burns.[4] The proportion of causes of burns are different depending on the different social, economical, geographical and cultural variations. The planning to prevent the cause of burns also depends on different etiology of burns.[5] Present Study was aimed to study socio-demographic factors and their association with gender among burn cases among admitted burn cases at a tertiary hospital.

MATERIALS AND METHODS

Present study was Hospital based Cross-Sectional Study, conducted in burn care unit of Surgery Department. The study period was from May 2019 to November 2021. i.e. total period of two and half year. Study was approved by institutional ethical committee.

Inclusion Criteria

- All the burn cases that were admitted to burn care unit in tertiary care hospital.

Exclusion Criteria

- The burn patients treated who were treated on outpatient basis
- Those who refuse to give consent and non-cooperative
- patients with poor general condition and without any attendant or relative.

Study was explained to participants in local language & written informed consent was taken. All the information was filled in a specially prepared pretested proforma (patient information sheet) by visiting the burn ward daily till the sample size is achieved. In all patients, age, sex, residential address, religion, educational level, type of family, socio economic status, etc. together with details of tobacco use (both smoking and non-smoking), alcohol use. Past history of illness was included in case of any major disorders along with mental illnesses in the recent past.

Variable included in the study were age, religion, marital status, type of family, education, personal habits (addiction / drug abuse), socioeconomic status, cause of burns, agent of burns, source of burns, type of clothing, methods of extinguishing fire, social factors involved, degree of burns & estimation of body surface area.

The data were entered in Microsoft Excel 2010 spreadsheet and analyzed. The association was assessed by using the chi-square test using SPSS software. For all the statistical tests, the p-value of < 0.05 was considered statistically significant, and the p-value of < 0.01 was considered statistically highly significant.

RESULTS

Out of 230 study subjects, the maximum were females constituted 126(54.78%) and males constituted 104(45.21%). Major age group affected was 16-30yrs i.e. 71 of which majority were females 41(57.7%) and the rest were males 30(42.25%), followed by age group 31-45yrs constituted 54 of which majority were males 29(53.70%) and the rest were females 25(46.29%). When the statistical test was applied, the association between age and gender found to be statistically significant.

Table 1: Association between Age And Gender In The Burn Patients:

Age	Male	Female	
<5yrs	19(57.57%)	14(42.42%)	33(100%)
6-15yrs	11(37.93%)	18(62.06%)	29(100%)
16-30yrs	30(42.25%)	41(57.7%)	71(100%)
31-45yrs	29(53.70%)	25(46.29%)	54(100%)
46-60yrs	8(33.33%)	16(66.66%)	24(100%)
≥61yrs	7(36.84%)	12(63.15%)	19(100%)
Total	104 (45.21%)	126 (54.78%)	230 (100%)

$\chi 2 = 11.73$; df = 5 ; $p < 0.05$ (significant)

It was observed that majority were rural females constituted 75 (59.52%), followed by rural males 60(57.69%), urban males 44(42.30%), urban females 51(40.67%). Thus though maximum number of burn cases were recorded from rural area, there is no statistically significant difference among the place of residence and gender among burn patients under study ($p>0.05$).

Out of 230 study subjects, the maximum were Hindu constituted 163 out of them 75(46.01%) were male and 88(53.98%) were female.

Out of 230 burn patients under study majority patients were illiterate constituted 63 of which males were 23(22.12%) and females were 40(31.75%), primary school education was majorly observed among females 22(66.66%) and males

11(33.33%), there was no statistically significant difference between gender and education p(>0.05).
Out of 132 unemployed burn patients majority were females 101(76.51%) and males were 31(23.48%). followed by semiskilled occupation 31 of which 24(77.41%) were males and rest were females 7(22.58%). There was statistically significant difference among occupation and gender among burn patients i.e. females who are unemployed have the higher chances for burn injuries (p<0.05).
Out of 230 burn patients majority of the patients belonged to class IV socioeconomic status constituted a total of 95 of which males were 42(44.21%) and females were 53(55.79%), followed by class III constituted 65 patients of which males were 33(50.76%) and females were 32(49.23%). There was statistically significant difference was observed among the socio economic class and gender after pooling the data (p<o.o5).

Out of the 230 burn patients majority were married, constituted 115 of which females were 63(54.78%) and males were 52(45.21%), followed by unmarried 78, of which females were 41(52.56%) and males were 37(47.43%). There was no statistically significant difference among marital status and gender among burn patients under study.
Out of 230 burn patients under study majority were found to be not using tobacco in any form 169 of which females were 118(93.65%) and males were 51(49.04%). Out of the 230 burn students under study majority were non-alcohols 181 of which females were 126(69.91%) and males were 55(30.38%).
Out of total 230 burn patients, majority of the females suffered from indoor burns122 (96.82%) and males had majority of the burns outdoor (52.88%). The place of occurrence and gender was found to have statistically significant difference among the burn patients under study (p<0.05).

Table 2: Distribution Of Burn Patients socioeconomic variables

	Male	**female**	**Total**	**P value**
Residence				
Urban	44(46.31%)	51(53.68%)	95(100%)	$\chi2 = 0.07$; df = 1 ; p >0.05 (not significant)
Rural	60(44.44%)	75(55.55%)	135(100%)	
Religion				
Hindu	75(46.01%)	88(53.98%)	163(100%)	
Muslim	21(42%)	29(58%)	50(100%)	
Buddhism	8(47.05%)	9(52.94%)	17(100%)	
Education				
Illiterate	23(36.50%)	40(63.49%)	63(100%)	
Primary	11(33.33%)	22(66.66%)	33(100%)	
Mid school	12(38.70%)	19(61.29%)	31(100%)	
Highschool	19(55.88%)	15(44.11%)	34(100%)	
Inter/Higher secondary	24(48.97%)	25(51.02%)	49(100%)	
Graduation	14(73.68%)	5(26.31%)	19(100%)	
Professional	1(100%)	-	1(100%)	
Occupation				
Unemployed	31(23.48%)	101(76.51%)	132(100%)	$\chi2 = 59.49$; df = 3 ; p = <0.05 (significant)
Unskilled	10(66.66%)	5(33.33%)	15(100%)	
Semiskilled	24(77.41%)	7(22.58%)	31(100%)	
Skilled	13(86.66%)	2(13.33%)	15(100%)	
Clerical/farmer/shopkeeper	21(84%)	4(16%)	25(100%)	
Semi professional	5(41.66%)	7(58.33%)	12(100%)	
Socio-Economic Class				
I	2(66.66%)	1(33.33%)	3(100%)	
II	9(81.81%)	2(18.18%)	11(100%)	
III	33(50.76%)	32(49.23%)	65(100%)	
IV	42(44.21%)	53(55.79%)	95(100%)	
V	18(32.14%)	38(67.85%)	56(100%)	
Type of family				
Joint	50(46.29%)	58(53.70%)	108(100%)	
Nuclear	21(53.84%)	18(46.15%)	39(100%)	
Three generation	33(39.75%)	50(60.24%)	83(100%)	
Marital status				
Married	52(45.21%)	63(54.78%)	115(100%)	
Unmarried	37(47.43%)	41(52.56%)	78(100%)	
Widowed	9(37.5%)	15(62.5%)	24(100%)	
Separated	5(50%)	5(50%)	10(100%)	
Divorced	1(33.33%)	2(66.66%)	3(100%)	
Tobacco usage				
Not using	51(30.17%)	118(69.82%)	169(100%)	
Smoking	18(100%)	-	18(100%)	
Chewing	35 (81.39%)	8(18.60%)	43(100%)	
Alcohol drinker				
No	55(30.38%)	126(69.61%)	181(100%)	
Mild	20(100%)	-	20(100%)	

Moderate		24(100%)	-	24(100%)	
Severe		5(100%)	-	5(%)	
Place					
Indoor		49(28.65%)	122(71.34%)	171(100%)	$\chi 2 = 73.81$; df = 1 ; p <0.05 (significant)
Outdoor	Workplace	40(95.23%)	2(4.76%)	42(100%)	
	Others	15(88.23%)	2(11.76%)	17(100%)	

Among the accidental burn cases majority were females 88(51.16%), among attempted suicidal cases majority were females 16(51.61%), among attempted homicidal also majority were females 22(81.48%). As p<0.05, it was evident that there is statistically significant difference among the cause of burns and gender

It was observed that majority of the burns in female were domestic i.e123 (97.61%), among males majority of the burns were commercial 43(41.34%) and there was statistically significant difference among the source of burns and gender among burn patients under study. Thus it was explained that there female preponderance in domestic burns.

Out of 230 burn patients majority of the burns occurred due to flames i.e. 166 of which 104 (62.65%) were females and males were 62 (37.34%), followed by electrical burns 17 of which males were 14 (82.35%) and females 3 (17.64%). Out of 166 flame burns maximum were because of stove flames constituted 80(48.19%), followed by open flame 35(21.08%), kerosene 26(15.66%), inflammables 12(7.22%), chemical induced 6(3.61%), Gas leakage 5(3.01%), Least were commercial flame burns induced by welding sparks 2(1.20%).

Out of the total 230 burn patients under study 184 were domestic burns of which 123(66.84%) were females and 61(33.15%) were males. Commercial burns were found to be 46 of which maximum were among males 43(93.47%) and females were only 3(6.52%).

It was observed that females are majority with TBSA >70% i.e.50 (64.93%), also among the burn patients with TBSA 11-40% majority were females 64 (52.03%). But among patients with less than 10% TBSA majority were males 18(60%). There is statistically significant difference among percentage of burns and gender among burn patients under study (p<0.05). Showcasing female preponderance in severe form of burns.

Out of 230 burn patients under study 169 wore synthetic clothes, of which males were 69(40.82%) and females were 100(59.17%). Cotton clothes were worn by a total of 61 of which males were 35(57.37%) and females were 26(42.62%).

Table 3: Distribution of burn patients According to burns characteristics

	Male	**Female**	**Total**	
Cause of burn				
Accidental	84(46.15%)	88(48.35%)	182(100%)	X2= 8.80%; df=2;p <0.05 (significant)
Suicidal	15(48.38%)	16(51.61%)	31(100%)	
Homicidal	5(18.51%)	22(81.48%)	27(100%)	
Agent of burn				
Flame	62(37.34%)	104(62.65%)	166(100%)	
Boiling water (scalds)	9(56.25%)	7(43.75%)	16(100%)	
Hot oil	2(22.22%)	7(77.77%)	9(100%)	
Electrical	14(82.35%)	3(17.64%)	17(100%)	
Chemicals	13(86.66%)	2(13.33%)	15(100%)	
Steam	3(60%)	2(40%)	5(100%)	
Others	1(50%)	1(50%)	2(100%)	
Source of burn				
Domestic	61(33.15%)	123(66.84%)	184(100%)	X2=54.06; df=1;p<0.05 (significant)
Commercial	43(93.47%)	3(6.52%)	46(100%)	
Percentage of burns				
<10%	18(60%)	12(40%)	30(100%)	X2 =6.226; df = 2 ; p < 0.05 (significant)
11 - 40%	59(47.96%)	64(52.03%)	123(100%)	
41 - 70%	27(35.06%)	50(64.93%)	77(100%)	
Clothing				
Synthetic	69(40.82%)	100(59.17%)	169(100%)	
Cotton	35(57.37%)	26(42.62%)	61(100%)	

Most commonly used method for extinguishing fire were wet cloth (45.21%), water dousing (43.02%), blanket wrapping (41.74%), removal of burn cloth (36.53%), floor rolling (31.30%). Least followed method was found to be usage of fire extinguisher (2.60%).

Table 4: Method of Extinguishing Fire (*Multiple Responses): (N=230)

Method	**Male**	**Female**	**TOTAL**
Water dousing	49	50	99(43.04%)
Blanket wrapping	46	50	96(41.74%)
Wet cloth	44	60	104(45.21%)
Removal of burn clothing	50	34	84(36.53%)

Floor rolling	43	29	72(31.30%)
Sand application	17	20	37(16.09%)
Manual pressure	20	14	34(14.78%)
Fire extinguisher	5	1	6(2.60%)
Others	10	13	23(10%)

It was found that major social factor involved in burn patients is financial/economical problem 140 (60.86%), followed by family conflicts 82 (35.66%), other family issues 79 (34.43%), others 57 (24.78%), employment problems 56(24.34%), alcoholic husband 52 (22.60%), addictions 40 (17.39%), gambling 35 (15.21%), handicapped 18 (7.82%), polygamy 16 (6.95%). The social factor dowry was found to be 18 (7.82%).

Table 5: Study of Social Factors Involved and Gender

Social factor	Male(*n=104)	Female(*n=126)	Total
Family	40	39	79(34.34%)
Financial	80	60	140(60.86%)
Employment	49	7	56(24.34%)
Dowry	-	18	18(7.82%)
Alcoholic Husband	-	52	52(22.60%)
Polygamy	15	1	16(6.95%)
Gambling	25	10	35(15.21%)
Family Conflicts	40	42	82(35.66%)
Handicapped	8	10	18(7.82%)
Addictions	30	10	40(17.39%)
Others	34	23	57(24.78%)

Among 230 burn cases 166 were flame burns of which majority were accidental 117(70.84%) followed by attempted suicidal 27(16.26%), attempted homicidal were 22(13.25%). Electrical burns were 17 of which accidental were 16(94.11%) and attempted homicidal were 1(5.88%). scalds were 16 of which majority were accidental 14(87.5%) followed by attempted homicidal were 2(12.5%). chemical burns were 15 of which 12(80%) were accidental, followed by 2(13.33%) attempted homicidal and 1(6.66%) attempted suicidal. Hot oil burns were 9 of which majority were accidental, followed by steam burns and others in both the categories majority were accidental with 70.77%, 80% and 100% respectively.

Table.6: Study of Cause of Burns According to the Agent of Burns and Gender:

	Cause of burns			
Agent of burns	**Accidental**	**Attempted suicidal**	**Attempted homicidal**	**Total**
Flame	117(70.48%)	27(16.26%)	22(13.25%)	166(100%)
Scalds	14(87.5%)	-	2(12.5%)	16(100%)
Hot oil	7(77.77%)	2(22.22%)	-	9(100%)
Electrical	16(94.11%)	-	1(5.88%)	17(100%)
Chemicals	12(80%)	1(6.66%)	2(13.33%)	15(100%)
Steam	4(80%)	1(20%)	-	5(100%)
Others	2(100%)	-	-	2(100%)
Total	172	31	27	230

DISCUSSION

In present study, out of all the burn patients, 104 were males and 126 were females. Major age group affected was 16-30yrs i.e. 71 of which majority were females 41(57.7%) and the rest were males 30 (42.25%), followed by age group 31-45 yrs constituted 54 of which majority were males 29 (53.70%) and the rest were females 25 (46.29%). Similar findings were found in Razaee R et al,[6] majority of the victims belonged to 20-50yrs constituted 54.7%. Kurt et al,[7] majority belonged to 20-40 yrs age group. Sohaib AM et al,[8] majority of the burn victims belonged to the age group 16-30 yrs i.e. 54%. Bain J et al,[9] majority of the burn victims belonged to the age group of 15-45 yrs.

Out of 230 burn patients majority of the patients belonged to class IV socioeconomic status constituted a total of 95(41.31%) of which males were 42(40.38%) and females were 53(42.06%). Only 3(1.31%) were from class I socioeconomic status of which males were 2(1.92%) and females were 1(0.79%). According to WHO[5] the incidence of burns in low and moderate income countries (LMIC) is 1.3 per 100,000 population compared to an incidence of 0.14 per 100,000 population in high income countries. Nabachandra,[10] the majority (57.57%) belonged to middle income group, followed by those belonging to low income (39.39%) group; while, among the females, the majority of the victims belonged to lower socio-economic group (68.75%). Daisy et al,[11] the lower, income group there were 69 children, where as in the higher income group only 39 children were involved among 210 parents ($p<0.05$).

In the present study of the total 230 burn patients, 171 (74.35%) were found to have burns indoor, males 49(47.11%), females were 122(96.82%). Outdoor burns were found to be maximum in males constituted about 55(52.88%), where as in females it was only 4(3.18%) among a total of 59(25.65%).

Similar findings were observed under study conducted by Honnegowda et al,[12] majority of the burn in females were at home i.e. 97.5% when compared with males only 36.11% sustained burns at home. Jaiswal et al,[13] 85% burns occurred at home. Abrol A et al,[14] majority of the burn occurred in kitchen 88.6%, followed by living room 14%. Work place burns found to be 2.6% and burns due to outdoor activities were found to be 8.6%.

In the present study it was found that maximum burns are accidental in occurrence, out of 230 burn cases under study it was seen that maximum burns are accidental in occurrence, a total of 182 of which males were 84(46.15%) and females 88 (48.35%), followed by suicidal burns 31 of which majority were observed among females 16 (51.61%) and males 15 (48.38%), homicidal burns were 27 of which majority were observed among females 22 (81.48%) and males 5 (18.51%).

Similar findings were observed in study conducted by Alipour J et al,[15] most of the burns were accidental (66.2%). Jain M et al,[16] that majority of the burns occur by accident i.e. 94%, followed by suicidal and homicidal. Ali SA et al,[17] 96.7% cases were accidental, followed by suicides 2.8% and homicide 0.4%.

In the present study it was found that major social factor involved in burn patients is financial/economical problem (60.86%), followed by family conflicts 35.66%, other family issues 34.43%, others 24.78%, employement problems 24.34%, alcoholic husband 22.60%, addictions 17.39%, gambling 15.21%, handicapped 7.82%, polygamy 6.95%. The social factor dowry was found to be 18(7.82%).

Similar findings were observed Daruwalla N et al,[18] in the qualitative study done in two major burn units with 33 admitted women with burns found that combination of poverty and cultural predescent was common to all along with co-existed household conflicts, gender based violence and alcohol use as underlying cause. Shanmugakrishnan et al,[19] found out unearthed family problems in 18 out of 25 suicidal cases, depression due to other illness in 6, and dowry related death in one; 5 sustained acid burns and 3 flame burns due to personal rivalry out of 8 homicidal cases; incidental 5, while trying to save, other burn victims.

It was observed that majority of the flame burns were seen among female constituted 104(82.53%), followed by males with flame burns 62(59.61%) There is statistically significant association between agent of burns and gender among burn patients under study, explained that female have more preponderance for flame burns than males effected with flame burns. Similar findings were observed in study conducted by Honnegowda et al,[12] Sohaib AM et.al,[8] & Bain J et al,[9] where majority of the flame burns were observed to be in females.

It was observed that though the flame burns was majority in both commercial (59.61%) and domestic space (82.53%), There was also a statistically significant association between agent of burns and gender among burn patients under study. Similar findings were observed in studies conducted by Alipour J et al,[15] Shanmugakrishnan et.al,[19] Srivastava S et al,[21] Alexander V et al,[22] & Akhtar M et al,[23] it was found that majority of flame burns were occurring in indoor spaces compared to the flames burns in outdoor space.

Majority of the female burns are domestic i.e. 97.61% and there is statistically significant association between source of burns and gender among burn patients under study. Thus it was explained that there female preponderance in domestic burns. Similar findings were observed under study conducted by Hannegowda et al,[12] where female preponderance among the burn cases occurred at domestic places.

Females are majority with TBSA >70%, There is statistically significant association between percentage of burns and gender among burn patients under study. Showcasing female preponderance in severe form of burns. Similar findings were observed in studies conducted by Jain M et.al,[13] Akhtar M et.al,[23] & Jaiswal et al,[16] where majority of burns were caused by flame burns with female preponderance and was also shown that third degree burns or burns with large TBSA involvement was observed in females.

In the present study it was evident that there is statistically significant association between cause of burns and gender. Though majority of burns were accidental in nature in both genders with 80.76% and 69.74% respectively, there was increased incidence of attempted homicidal in females 22 (17.46%) when compared with males (4.80%). Similar findings were observed in study conducted by Alipour J et al,[15] Jain M et al,[13] Ali SA et al,[17] & Shanmugakrishnan et al,[19] that there preponderance of female burns in all the categories i.e. accidental, attempted suicidal and homicidal were majority when compared with male counter parts.

Limitations

Limitations of present study were, this was cross sectional study it has an inherent weakness in finding associations. Some of the variables analysed in this present study were based on the information given by the participants. Hence an element of unavoidable recall bias could be present in the study. As it was cross sectional study design only internal comparison was done to see any association. No follow up has been done to ascertain the ultimate outcome.

CONCLUSION

Majority of the burn patients belonged to reproductive age group, low socioeconomic status, females, illiterates or with primary school education. Burns were found to be high among married people in particular among females whose marital life was less than 1yr. Majority of the burns occurred in Indoor places because of flame particularly in kitchen, the burns were extenuated by synthetic clothing. Among males occupational burn injuries particularly chemical, welding, electrical burns found to be high. Many social factors are also responsible for burns in certain age groups and populations.

Thus burns are haunting problem even today causing serious injuries, especially in terms of scarring, disability, disfigurement and need for rehabilitation and prolonged care. The message is "prevent the burn before it devastates".

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