

ORIGINAL ARTICLE

Role of Apparels in Burns due to Domestic Violence – A tool for assessing Degree of Burns

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ABSTRACT

Background: Human life is subject to certain environmental, cultural and ethnic origin factors. Based upon the above facts loose and tight variety of clothing/apparel are commonly used. Fire and flames are an integral part of human life on the other hand and accidents do occur in natural course of history. In such accidents type of apparel one might be wearing play a great role in degree or severity of burns. Association and assessments need to be established in this regard.

Methods: The study has been conducted on 250 cases of dry flame burns in AED of Mayo Hospital Lahore/Medicolegal Clinic of King Edward Medical University Lahore for a period of nine months in 2017-18. The population of 250 cases were selected through convenient non-probability purposive sampling technique. The study descriptive cross-sectional study design was applied to the above population selected for the study.

Results: Our study revealed 1.6% females were involved more than males in the burn incident during the period of study. A wide majority up to 70% used *Shalwar and Kameez* of loose wearable category as per culture of the country in comparison to the relatively tight clothing of *Trousers and Pantaloon*s variety.

A grossly significant role has been established with a p value of 0.024 that loose variety of apparel are responsible for causing greater degree of damage in burns as compared to that of tight variety of apparel worn at the time of incidence.

Conclusion: The study concludes that wearing relatively short apparels or of tight i.e. *Trousers and Pantaloon*s variety can be safe, protective and a healthy habit during cooking, working in fire burning vicinity like that of industry, hotels, restaurants and winter outdoor activities. The loose variety hereafter referred as *Shalwar and Kameez* variety of cultural apparels can be dangerous and even life threatening when it involves higher percentages of burns.

Keywords: Burns, Apparel, Clothing, Degree of Burns

INTRODUCTION

Its natural human tendency to clad oneself in way of one's own likes. Depending upon the region of the world and ethnic origin it may be a sort of loose (*Shalwar Kameez*)¹ or tight (*Trousers and Pantaloon*s)² dressing or heavy and long or very short, again determined by the environment and sexual disparities³. Burns due common source of fires resulting into dry flame burns invariably involve the apparels worn at the time of incidence⁴. Most of the time this behavior of cladding and type of the fabrics or its composition greatly enhance the fire incidence magnitude and hence the degree of damage^{5,6}.

Clothing or apparel one use to clad his/herself is not involved in all types of burns, it is typically spared in scalds – burns due to hot liquids⁷, a detrimental factor in sorting out of types of burns which of paramount importance to medicolegal cases. Rest all types of fire sources or mechanisms almost invariably burn the clothing or apparel worn at the time of incidence of burn though pattern may be different. Electrical⁸ and chemical⁹ burns pattern on clothing may be entirely different than dry flame burns¹⁰.

The degree of burns are classically placed in first, second and third degree of burns involving outer most layer of skin, outer and underlying skin layers and the deeper layers of skin respectively¹¹. The degrees of burns determine the severity of burns depending upon the magnitude of fire and precipitating factors like cloths or apparel worn at the time of incidence¹². Assessment of degree of burns in return determines the medical severity of burns as first and second degree burns are painful involving the part of the skin having nerve endings in it while third degree burns though more damaging than former category but less painful¹³. This is then utilized to determine the time elapsed to return to routine life activities, length of stay in the hospital and time required to full recovery which are very crucial in medicolegal situations¹⁴.

In Pakistan wearing the loose clothing or apparels while performing the routine work are the part and parcel of the culture. To example a few are that of house wives in the kitchen and the pediatric or geriatric age groups to get warmth in the winter in the

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social circle. Other includes the professional chefs in the restaurants or hotels and the industry where the employees are involved in likewise activity use relatively use or shallow type of apparels i.e. *Shalwar and Kameez*¹. While still the quiet developed and metropolitan citizens of Pakistan a greater portion of the population use *Trousers and Pantaloon*s as their routine apparels². With growing and wide variations in the climate change the life style in domestic and commercial spheres change accordingly and is adopted a fresh. The community then need to adopt the safe, protective and healthy methods to live and prosper.

MATERIALS AND METHODS

The data was collected from victims of burns incident from dry flame burn sources presenting in the Accident and Emergency Department of Mayo Hospital Lahore and filtered in the Medicolegal Clinic of King Edward Medical University Lahore between December 2017 to August 2018 for a period of nine months.

The sample size consisted of 250 cases of dry flame burns were included in the study after taking a fully informed consent for the current study after approval of Ethical Review Board and Project Evaluation Committee. The targeted population of the study was the rural and urban areas of Lahore being drained into one of biggest tertiary care hospital of the city i.e. the Mayo Hospital Lahore.

A convenient purposive non-probability sampling technique was applied for collection of 250 suitable cases of the targeted population being drained into the study settings. The descriptive cross-sectional study design was applied on the collected sample size. An already tested and applied questionnaire was used to collect the data as a tool for research method. Two categories of apparel i.e. *loose* and *tight clothing* were studied and their association for causation of degree of burns was then analyzed. The data was then analyzed in the Statistical Package for Social Sciences version 21.0 and a p value of less than 0.05 was taken as statistically significant and a confidence interval of 95% was taken into account for further analysis.

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RESULTS

The results for 250 cases of dry flame burns presented in the above study settings in the mentioned time frame were analyzed. After assessment of different age groups and their gender the role of apparels and its causation for degree of burns was analyzed. The relative findings are mentioned as below.

Age and gender distribution: The age of all the study participants were categorized into infants labelled as less than 1 year, children from 1 to 12 years, from 13 to 25 years were classified into adolescents, 26 years to 50 were categorized as adults and those of more than 50 years were called as elders (Table 1). The gender as per convention was into males and females depicted separately in each age group as shown in table 01 below.

Table 1: Age and gender frequency distribution

Category	Age	Male	Female
Infants (Less than 1 Year)	24(9.6%)	11(4.4%)	13(5.2%)
Child (1 to12 Years)	113(45.2%)	62(24.8%)	51(20.4%)
Adolescents (13 Years to 25 Years)	31.2%	1(0.4%)	2(0.8%)
Adults (26 to 50 Years)	38(15.2%)	14(5.6%)	24(9.6%)
Elders (Above 50 Years)	72(28.8%)	23(9.2%)	49(19.6%)
Total	250(100%)	112(44.8%)	138(55.2%)

As shown above 9.6% infants with count of 24 out of 250 cases of burns with 11(4.4%) males and 13(5.2%) females with female preponderance. Out of 11 (45.2%) children there 62(24.8%) males and 51(20.4%) females with male predilections in this age group thereby showing the highest frequency in this age bracket for exposure to burn incidences. Second highest frequency for burns has been exhibited by elders age groups with 72(28.8%) elders having 23(9.2%) males and 49(19.6%) females with female exposure more than twice of males. There were total 38(15.2%) adults comprising of 14(5.6%) males and 24 (9.6%) females, again almost twice of the male exposure females suffered burns incidents.

Frequency Distribution of Apparels Worn at the time of Incidence: Apparels used or clothing worn at the time of incidence were categorized into loose (*Shalwar Kameez*)¹ or tight (*Trousers/Pantaloons*)² based upon the fact that the choice of population determined by the culture, religion and ethnic origin in the study settings remained these two categories predominantly. The sample size of 250 shared the loose (*Shalwar Kameez*)¹ or category dominance of 168(67.2%) against those of tight (*Trousers/Pantaloons*)² category showing just 82(32.8%). Hence the culture of *Shalwar Kameez* involvement showed two third majority of all the victims of burns wearing loose category of apparels at the time of incidence (Fig. 1).

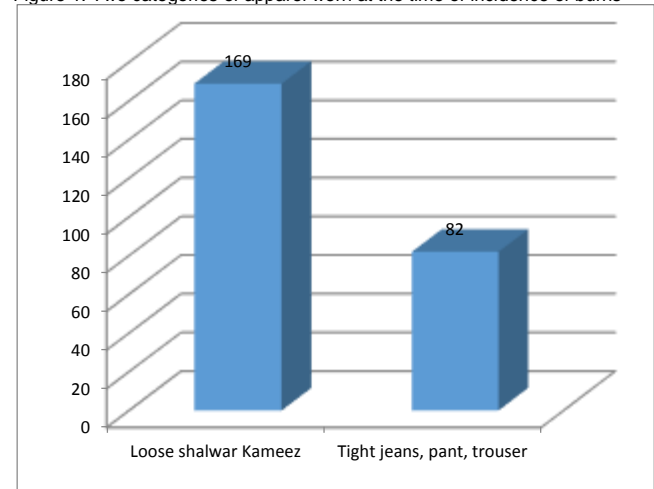
Role of apparels in causation of burns severity (Degree): In current study the categories of apparels have been described in detail and frequencies have been depicted in figure 01 above. In this study we collected the data which presented only with first and second degree burn while there was not even a single case of burn which could fall in the third category. So the assessment for causation of degree of burn was analyzed for first and second degree only with the two categories of apparels being worn at the time of admission. The role of apparel in relation to level of damage and its significance is analyzed in the table 2.

Table 2: Apparels and Degree of Burns (n=250)

Apparel Categories (worn at the time of Incidence)	Degrees of Burn		
	First degree (n=240)	2 nd degree (n=10)	Total
Loose (<i>Shalwar Kameez</i>) ¹	158	10	168

Tight (<i>Pantaloons</i>) ²	(<i>Trousers</i>)	82	0	82
P value 0.024				

Figure 1: Two categories of apparel worn at the time of incidence of burns



As shown in table 02 above out of 250 cases of burns in the current study there were 240(96%) cases who presented with first degree burns while just 10(4%) presented with second degree burns. The assessment for loose and tight categories of the apparels worn at the time of incidence was assessed level of significance was calculated as shown in the table 02 above.

In the first degree burns where 240(96%) cases presented comprised of 158(63.2%) cases with loose category of apparels wearing *Shalwar Kameez* while just 82(32.8%) presented in the tight category wearing *Trousers/Pantaloons*. In the second degree burns there presented a total of 10 cases of burns making only 4% contribution of the entire population. Out of those all presented with first category of apparels i.e. loose clothings –*Shalwar Kameez*. So among the total 250 cases of burns the contribution of the loose category of apparels shared 168 cases with a valid percent of 63.2% and rest 82 were of tight category i.e. *Trousers/Pantaloons* with 32.8% without having even a single presentation in second degree burns.

The role of apparels in causation of degree of burns was found to be significant with a p value of less than 0.05 (0.02) as shown in the table 02 above. The significance shows the loose variety of apparels are more devastating in dry flame burn cases for greater damage i.e. second degree of burns in current study. There were no second degree burns with tight variety of apparels while just 10 cases in first degree of burns.

DISCUSSION

The fires or dry flame burns can cause variable degree of burns and medical severity, the study focusses on the role of apparels worn at the time of incidence for causation of degree of burns. Based upon the prevalent trends of wearing shalwar and kameez i.e. a loose variety of clothing/apparel fittings and tight variety i.e. the trousers and pantaloons and their connection for causation of degree of damage.

A population where both the loose i.e. *Shalwar and Kameez* and the tight variety that of *Trousers and Pantaloons* were routine apparels being used, was chosen to get significant results. Still the cultural habits (of wearing the loose variety i.e. *Shalwar and Kameez*) superseded the latter category. However for comparison analysis the required population of both category were enough emphasize on the significant role of apparels in the burn incident.

It has been found that the loose variety of apparel say *Shalwar and Kameez* are more involved in causing damage to skin after fire incidence than the tight variety of cloths. As much as 96%

of cases of burns in the current study have been found causing first and second degree burns. Among those 63.2% were those of first degree burns wearing *Trousers and Pantaloon* variety of apparels and just 32.8% were found having second degree of burns. The study observations have been found in consistence with those of (Gupta 2016)¹ and no research observations have been found in contradiction to the current study^{3,5}.

One of the significant factor of the South Asian culture including Pakistan women like that of house wives were involved in fire i.e. cooking events and they almost invariably use loose variety of *Shalwar and Kameez* plus *Dupatta* and the same cause greater depths of burns^{17,18,19}. For this very reason the fire flame burn stays for a longer duration on the skin and burning deeper tissues signifies that loose clothing is responsible for the second and third degree burns. Contrary to it the tight clothing in the first instance does catch the fire immediately and if that happens can be controlled easily as compared to the first category of the apparels^{1,2,14}.

The tight variety of apparel in current study was worn by only 4% of all the cases of sample size at the time of incidence. And that was only reported to be causing first degree and there was not even a single case causing second degree burns with apparels of tight variety being worn at the time of incidence. The same was reported by (Yagou 2009)² and no significant role has been played by apparel worn at the time of incidence in causation of burns was reported by (Mell 2006)⁴.

CONCLUSION

Current study concluded with confidence that the loose variety of clothing/apparel are significantly involved in causing greater damage to the skin as compared to that of tight variety of apparel worn at the time of incidence. The loose variety of apparel at the time of incidence caught into fire caused first degree burns in 63.2% cases of the study population and second degree burns in 32.8% cases of burns. The remaining 4% of the cases of burns in current study were wearing tight variety of clothing/apparel and those all caused first degree burns and there was not even a single case with tight variety of apparel reported to have second degree burns. The association was also found to be grossly significant with a 0.024 p value. Hence the loose variety of clothing/apparel have been found having far greater chances of causing deeper burns than that of tight variety of apparel based upon the observations of current study.

Conflict of interest: Nil

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