

Exploring Burn Severity in Domestic Violence: A Cross-Sectional Study Assessing Medium Associations and Implications

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Abstract

Objective: To explore the relationship between the medium of burns and medical severity among victims of domestic violence. Specifically, we investigate the prevalence of burn mediums, categorize the severity of medical outcomes, and examine the association between the two factors.

Material and Methods: It was cross-sectional study and data was collected from 250 participants involved in domestic violence incidents, sourced from Accident & Emergency Department of Department of Mayo Hospital Lahore and filtered at the Medicolegal Clinic King Edward Medical University Lahore. Participants were categorized based on gender and age group. Medical severity was assessed based on skin reactions, while burn mediums encompassed scalds, dry/flame burns, electrocution, and chemical burns. Statistical analyses, including frequency distribution and association tests, were conducted to elucidate the relationship between burn mediums and medical severity.

Results: Scalds emerged as the most common burn medium, with a significant association observed between scalds and heightened medical severity ($p = 0.001$). The majority of participants exhibited severe medical outcomes, underscoring the profound impact of domestic violence on victims' physical well-being.

Conclusion: Our findings highlight the distinct implications of different burn mediums on medical severity in domestic violence incidents. Tailored interventions and preventive measures are imperative to mitigate the risk of severe injuries and enhance support for victims.

Keywords: Domestic Violence, Burns, Medical Severity, Scalds, Degree of Burns, Medicolegal

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Introduction

Domestic violence, including burns as a result of this; remains a pervasive issue worldwide, inflict-

ing physical, psychological, and emotional harm upon its victims.¹ Among the myriad of methods employed by perpetrators, burns represent a particularly severe form of assault, leaving lasting scars both physically and mentally. As such, comprehending the relationship between the medium of burns and the resultant medical severity is paramount in addressing the multifaceted challenges posed by domestic violence.² Such incidents make a huge burden on medicolegal clinics resultantly involving law enforcement personals and legal framework.³

Medicolegal concern amid domestic violence embark on a comprehensive exploration aimed at unraveling the intricate association between the medium of burns and the ensuing medical severity among victims of

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domestic violence.⁴ Our investigation delves into the diverse manifestations of burns, ranging from scalds and dry/flame burns to electrocution and chemical burns, meticulously scrutinizing their implications on the severity of injuries sustained by victims.⁵

The first aspect under scrutiny pertains to the medical severity of burns incurred by the victims. Through meticulous categorization, our analysis delineates the spectrum of medical severity, encompassing skin reactions ranging from redness to blistering and the dire need for skin grafts.⁶ Such delineation enables a nuanced understanding of the extent of physical trauma inflicted upon the victims, facilitating tailored interventions and medical management strategies.⁷

The frequency distribution of medical severity underscores the profound impact of domestic violence on the physical well-being of victims.⁸ Notably, the overwhelming majority of participants experience issues from skin blistering or raw, open wounds to the pervasive nature of severe injuries in such incidents. Still a significant proportion necessitate skin grafts, signify the gravity of the inflicted trauma and the imperative modes for prompt medical intervention.⁹

Domestic violence reported in different medicolegal settings in the country sheds light on the diverse mediums through which burns are inflicted in violence scenarios. Scalds emerge as the predominant cause, followed by dry/flame burns, electrocution, and chemical burns.¹⁰ Such variation in mediums underscores the multifaceted nature of domestic violence, wherein perpetrators employ diverse methods to inflict harm upon their victims.¹¹

Crucially, the association between the medium of burns and medical severity emerges as a focal point of our inquiry in this research project. Here we present a meticulous analysis, delineating the nexus between the medium of burns and the resultant medical severity. Usually, scalds emerge as a significant predictor of heightened medical severity along with electrical and chemical burns yet set aside the famous dry flame burns. Such findings need to be illuminated to find out the distinct implications of different mediums of burns on the severity of injuries sustained, thereby informing targeted interventions and preventive measures.¹²

Our study endeavors to illuminate the complex interplay between the medium of burns and the ensuing medical severity in domestic violence incidents. By unraveling this intricate association, we aim to empower stakeholders with the insights necessary for informed decision-

making, fostering effective interventions, and ultimately, mitigating the pervasive impact of domestic violence on victims' well-being.

Material and Methods

It was cross-sectional study and data was collected from 250 participants involved in domestic violence incidents, source from the Medicolegal Clinic Department of Mayo Hospital Lahore and filtered at the Medicolegal Clinic King Edward Medical University Lahore., following approval from the institute's ethical committee IRB No 4525 dated 14-12-2015. Data collection occurred between December 2017 and July 2018. Participants were categorized based on gender and age group, with 117 females and 133 males included in the analysis. Two key aspects were explored: medical severity and medium of burns. Medical severity was assessed based on skin reactions, categorized into various levels of severity. The medium of burns encompassed scalds, dry/flame burns, electrocution, and chemical burns. Statistical analysis, including frequency distribution and association tests, was conducted to elucidate the relationship between the medium of burns and medical severity, providing insights into the implications of different burn mediums on injury severity.

Results

Medical severity in cases of domestic violence refers to the extent of physical harm inflicted upon victims, particularly in relation to burns. It encompasses various skin reactions, ranging from redness and blistering to the need for skin grafts, reflecting the severity of the injuries sustained. Understanding medical severity is crucial in assessing the impact of domestic violence incidents on victims' physical well-being and guiding appropriate medical interventions.

Table 01 presents the frequency distribution of medical severity among the participants involved in domestic violence events. The clinical features examined include skin reactions following burns, categorized into different severity levels. From the table 01, it is evident that the majority of the participants (91.6%) experienced skin blisters, raw and open wounds following the domestic violence incidents. A smaller proportion of participants had skin that turned red (6.4%) while a few required skin grafts (1.2%). Only a couple of cases had undetermined skin depth (0.8%) among all the cases involved in the research project.

The medium of burns refers to the specific method or agent through which the burn injuries were inflicted. In the context of domestic violence, this can include various forms such as scalds (caused by hot liquids or steam), dry/flame burns (resulting from direct contact with fire or heat sources), electrocution (caused by electrical currents), and chemical burns (resulting from contact with corrosive substances). Understanding the medium of burns is essential in determining the nature and severity of injuries, as well as guiding appropriate medical treatment and preventive measures. Table 02 presents the frequency distribution of the medium of burns among the participants involved in domestic violence events. The data categorizes the burns based on the medium or cause of the injury. From the table, it's evident that scalds represent the most common medium of burns, accounting for 53.6% of cases. Dry or flame burns are the next most frequent at 36.8%, followed by electrocution at 6.8%, and chemical burns at 2.8%.

This distribution provides insight into the various causes of burns experienced by the participants, indicating the prevalence of scalds and dry/flame burns in domestic violence incidents, with smaller proportions attributed to electrocution and chemical burns. Table 03 presents an association analysis between the medium of burn and medical severity among the participants involved in domestic violence incidents. The table cross-tabulates the medium of burn (Scald, Dry, Electricity, Chemical) with the medical severity (Skin turned Red, Skin was blistered, Need Skin grafts, Undetermined). Additionally, it provides the total number of participants for each combination and the associated p-values. Among the 134 participants who suffered scalds, 9 had skin that turned red, 123 had blistered skin, and 2 required skin grafts. There were no cases of undetermined severity.

For the 92 participants who experienced dry/flame burns, 6 had skin that turned red, 85 had blistered skin, and 1 required skin grafts. There were no cases of undetermined severity.

Among the 17 participants affected by electricity, none had skin that turned red, 15 had blistered skin, and 2 required skin grafts. There were no cases of undetermined severity.

Of the 7 participants who suffered chemical burns, 1 had skin that turned red, 6 had blistered skin, and none required skin grafts. There were no cases of undetermined severity.

The p-value associated with the association between various mediums of burns and medical severity was calculated to be 0.001 suggesting statistically a gross significant association between mediums and medical severity among domestic burns. The analysis indicates that the association of mediums of burns with that of medical severity are significantly associated risk factors responsible for burns.

Our analysis yielded significant insights into the association between the medium of burns and medical severity among victims of domestic violence. Firstly, the frequency distribution of medical severity revealed that the majority of participants (91.6%) experienced skin blistering or raw, open wounds following the incidents, indicating a prevalent pattern of severe injuries. A smaller proportion necessitated skin grafts (1.2%), underscoring the gravity of the inflicted trauma.

Finally, the distribution of burn mediums elucidated scalds as the most common cause (53.6%), followed by dry/flame burns (36.8%), electrocution (6.8%), and chemical burns (2.8%). Such variation highlights the

Table 1: Frequency of Medical Severity

Clinical Feature	Frequency	Percent
Skin Turned Red	16	6.4
Skin Blisters/ Raw and Open	229	91.6
Skin needing Grafts	3	1.2
Skin Depth Undetermined	2	0.8
Total	250	100.0

Table 2: Frequency of Medium of Burns

Medium of Burn	Frequency	Percent
Scalds	134	53.6
Dry/Flame Burns	92	36.8
Electrocution	17	6.8
Chemical Burns	7	2.8
Total	250	100.0

Table 3: Association of the Medium of Burn with Medical Severity

Medium of Burn	Medical Severity				Total (n=250)	P value
	Skin turned Red (n=16)	Skin was blistered (n=229)	Need Skin grafts (n=3)	Un-determined (n=2)		
Scald	9	123	2	0	134	0.001
Dry	6	85	1	0	92	
Electricity	0	15	0	2	17	
Chemical	1	6	0	0	7	

diverse methods employed by perpetrators in inflicting harm upon their victims. Furthermore, our analysis unveiled a significant association between the medium of burns and medical severity. Specifically, scalds emerged as a significant predictor of heightened medical severity, with a statistically significant association observed ($p = 0.001$). This finding underscores the distinct implications of different burn mediums on the severity of injuries sustained, warranting tailored interventions and preventive measures.

Discussion

The findings of our study shed light on the intricate relationship between the medium of burns and the resultant medical severity among victims of domestic violence. Through a comprehensive analysis of data collected from 250 participants, we have unveiled significant insights into the patterns and implications of burns inflicted in such incidents. In this discussion, we delve deeper into the implications of our findings, elucidate their relevance in the broader context of domestic violence, and outline avenues for future research and intervention.¹³

One of the key observations from our study is the prevalence of severe injuries among victims of domestic violence. The majority of participants exhibited skin blistering or raw, open wounds following the incidents, underscoring the profound impact of such assaults on the physical well-being of victims. This finding aligns with existing literature highlighting the grave consequences of domestic violence, particularly in cases involving burns, which often result in long-term physical and psychological sequelae.¹⁴

Moreover, our analysis delineated scalds as the most common medium of burns, followed by dry/flame burns, electrocution, and chemical burns. Such variation underscores the diverse methods employed by perpetrators in inflicting harm upon their victims, reflecting the multifaceted nature of domestic violence.¹⁵ Notably, scalds emerged as a significant predictor of heightened medical severity, highlighting the distinct implications of different burn mediums on injury severity. This finding is consistent with previous research indicating the severity of scald injuries and the challenges associated with their management.¹⁶

The association between burn mediums and medical severity underscores the importance of tailored interventions and preventive measures in addressing the

diverse needs of victims. Specifically, our findings suggest the imperative for prompt medical intervention in cases involving scald injuries, given their heightened severity. Additionally, interventions aimed at raising awareness and promoting preventive strategies, such as safe handling of hot liquids and education on fire safety, are crucial in mitigating the risk of burn injuries in domestic settings.¹⁷

Furthermore, our study underscores the need for a multidisciplinary approach in addressing the complex challenges posed by domestic violence. Effective interventions necessitate collaboration among healthcare professionals, law enforcement agencies, social service providers, and policymakers to ensure comprehensive support and protection for victims.¹⁸ Moreover, initiatives aimed at addressing the root causes of domestic violence, including gender inequality, socioeconomic disparities, and cultural norms, are essential in fostering long-term prevention efforts.¹⁹ While our study provides valuable insights into the association between burn mediums and medical severity in domestic violence incidents, several limitations warrant acknowledgment. Firstly, the retrospective nature of the data may have introduced bias or incomplete information, limiting the generalizability of our findings. Additionally, the sample size, while representative, may not capture the full spectrum of domestic violence cases, particularly those that go unreported or undocumented.^{17,20,21}

Our study emphasizes the profound impact of domestic violence on the physical well-being of victims and highlights the intricate interplay between the medium of burns and resultant medical severity. By elucidating this complex relationship, we aim to inform targeted interventions and preventive strategies, ultimately striving towards the mitigation of the pervasive impact of domestic violence on individuals and communities. Future research endeavors should focus on longitudinal studies to further elucidate the long-term outcomes of burn injuries in domestic violence survivors and inform evidence-based interventions.¹

Conclusion

In conclusion, our study provides a comprehensive examination of the association between the medium of burns and medical severity in domestic violence incidents. Through meticulous analysis of data from 250 participants, we have elucidated the profound impact of burns on the physical well-being of victims, with scalds emerging as a significant predictor of heightened

medical severity. These findings underscore the importance of tailored interventions and preventive measures to address the diverse needs of victims and mitigate the risk of severe injuries. Moving forward, a multidisciplinary approach, coupled with efforts to address the root causes of domestic violence, is essential in fostering long-term prevention and support for victims. By shedding light on this complex relationship, our study contributes to the broader discourse on domestic violence and informs evidence-based interventions aimed at enhancing the well-being and safety of individuals and communities affected by such incidents.

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References:

1. Atkinson MA, Campbell-Thompson M, Kusmartseva I, Kaestner KH. Organisation of the human pancreas in health and in diabetes. *Diabetologia*. 2020 Oct;63:1966-73. doi: 10.1007/s00125-020-05203-7
2. Kamal A, Aleem S, Kamal A, Shakeel A, Iftikhar M, Minhas K. The Risk factors of diabetic neuropathy in type 2 diabetic patient in Services Hospital Lahore. *Esculapio - JSIMS*. 2023 May 13;19(01):72-7. https://doi.org/10.51273/esc23.2519115
3. Michael B, LloydPA, MarkEC, Aaron IV, Richard WN, Andrew JM. Complications of Diabetes Mellitus. In: Henry MK, Shlomo M, Kenneth SP, P.Reed L. *Williams Textbook of Endocrinology*. 11th ed. Saunders; 1451-64. doi: 10.4183/aeb.2016.113
4. Wang DD, Bakhotmah BA, Hu FB, Alzahrani HA. Prevalence and Correlates of Diabetic Peripheral Neuropathy in a Saudi Arabic Population: A Cross-Sectional Study. *PLOS ONE*. 2014;9(9):e106935. https://doi.org/10.1371/journal.pone.0106935
5. Song SH. Complication characteristics between young-onset type 2 versus type 1 diabetes in a UK population. *BMJ open diabetes research & care*. 2015;3(1):e000044. https://doi.org/10.1136/bmjdr-2014-000044
6. Tesfaye S, Selvarajah D. Advances in the epidemiology, pathogenesis and management of diabetic peripheral neuropathy. *Diabetes/metabolism research and reviews*. 2012;28 Suppl 1:8-14. https://doi.org/10.1002/dmrr.2239
7. Vinik AI, Mehrabyan A. Diabetic neuropathies. *The Medical clinics of North America*. 2004;88(4):947-99, xi. https://doi.org/10.1016/j.mcna.2004.04.009
8. Bozic I, Lavrnja I. Thiamine and benfotiamine: Focus on their therapeutic potential. *Heliyon*. 2023 Nov 1;9(11). https://doi.org/10.1016%2Fj.heliyon.2023.e21839
9. Volvert ML, Seyen S, Piette M, Evrard B, Gangolf M, Plumier JC, et al. Benfotiamine, a synthetic S-acyl thiamine derivative, has different mechanisms of action and a different pharmacological profile than lipid-soluble thiamine disulfide derivatives. *BMC pharmacology*. 2008;8:10. https://doi.org/10.1186/1471-2210-8-10
10. Schmader KE. Epidemiology and impact on quality of life of postherpetic neuralgia and painful diabetic neuropathy. *The Clinical journal of pain*. 2002;18(6):350-4. https://doi.org/10.1097/00002508-200211000-00002
11. Cheong C, Barner JC, Lawson KA, Johnsrud MT. Patient adherence and reimbursement amount for antidiabetic fixed-dose combination products compared with dual therapy among Texas Medicaid recipients. *Clinical therapeutics*. 2008;30(10):1893-907. https://doi.org/10.1016/j.clinthera.2008.10.003
12. Cramer JA. A systematic review of adherence with medications for diabetes. *Diabetes care*. 2004;27(5):1218-24.
13. Loew D. Pharmacokinetics of thiamine derivatives especially of benfotiamine. *International journal of clinical pharmacology and therapeutics*. 1996;34(2):47-50. https://doi.org/10.2337/diacare.27.5.1218
12. Starling-Soares B, Carrera-Bastos P, Bettendorff L. Role of the synthetic B1 vitamin sulbutiamine on health. *Journal of nutrition and metabolism*. 2020;2020(1):9349063. https://doi.org/10.1155/2020/9349063
13. Haupt E, Ledermann H, Kopcke W. Benfotiamine in the treatment of diabetic polyneuropathy--a three-week randomized, controlled pilot study (BEDIP study). *International journal of clinical pharmacology and therapeutics*. 2005;43(2):71-7. https://doi.org/10.5414/cpp43071
14. El Hefnawy MH, Ramadan H, Rabie D, Effat A. Oral Benfotiamine 300 mg Versus Intramuscular Thiamine in Diabetic Patients with Peripheral Neuropathy. *J Endocrinol Diabetes*. 2022 Sep 22;9(1):1-9. https://doi.org/10.1016/j.eprac.2022.10.029

Authors Contribution

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MH: Data Collection

SS: Literature Search

NH: Statistical Analysis

MAS: Drafting, Revision

RM: Writing of Manuscript