

## SELF-INFLICTED FIREARM INJURIES AS COMPARED TO THE ACCIDENTAL FIREARM INJURY; A COMPARATIVE ANALYTICAL STUDY TO DETERMINE THE COMMONEST SITE OF NON-SUICIDAL SELF-INFLICTED INJURIES

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### ABSTRACT

**Objective:** To determine the commonest site of non-suicidal self-inflicted firearm wound in comparison with accidental firearm wounds.

**Study Design:** Cross sectional study.

**Place and Duration of Study:** Combined Military Hospitals Jhelum, Bannu & Kharian, from Nov 2014 to Nov 2018.

**Methodology:** Sixty-four patients with firearm injuries were observed. All the participants were males between the ages of 18-60 years. The injuries were determined to be either self-inflicted or accidental by an independent committee. The participants' replies and responses were assessed by dividing them into five main domains by using quantitative software SPSS version 20. Variables involving demographic characteristics of participants such as age, occupation, marital and socioeconomic status, were associated with mental health variables such as psychological stress, previous history of self-harm and clinical psychiatric illness.

**Result:** Fifteen subjects were found to have self-inflicted injuries and 50 had accidental injuries. There was a marked preference for left foot and left lower limb as a site for non-suicidal self-inflicted injuries (94.6%) as compared to other sites (left upper extremity 1.8%, chest 1.8% and right lower extremity 1.8%).

**Conclusions:** Left lower limb and left foot was a more common site for self-injury as compared to the other sites.

**Keywords:** Accidental, Firearms, Non-suicidal, Self-inflicted.

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### INTRODUCTION

Non-suicidal self-injury (NSSI) is a recent diagnostic term used to define behavior where a person self-harms without suicidal intent. It differentiates between someone who is not suffering from a psychotic disorder and someone who is, and even between patterns of injury in terms of inflicting one lethal injury versus infliction of several non-fatal mutilations repeatedly.<sup>1</sup> Accidental firearm injuries manifest as widely spread skeletal injuries when compared with self-inflicted injuries having non-suicidal intent which have a localized pattern. Causes of accidental firearm injuries may include personal or mechanical errors such as failure to perform normal safety procedure (NSP) before, during or after handling a weapon, use of firearms in closed spaces which increases the possibility of ricochet, inexperienced user and/or faulty weapon itself.<sup>2</sup>

Self-inflicted injuries may lead to handicap in otherwise healthy individual and carry considerable mortality and morbidity as well. Such injuries have an

extensive social, emotional, and economic impact on those affected, including their family, friends and the community. These cases also require emergency treatment, hospitalization and long-term care; hence costly healthcare resources have to be channelized from other priorities towards their management.<sup>3</sup> Their management appears as a considerable challenge and demands an interdisciplinary course of action requiring cooperation and teamwork of the surgeon, anesthetist, rehab specialist and psychiatrist. The surgeon evaluates and fixes damaged and severed tissues to restore anatomy and function. The anesthetist secures patient's airway and breathing; the rehab specialist ensures recovery of limb function while the psychiatrist provides adequate mental and emotional care as well as supervision during and after surgical treatment,<sup>4</sup> However, in most developing countries late presentation to the hospital, lack of adequate management in ambulance and poor pre-hospital care predisposes to increased morbidity and mortality.<sup>5</sup>

Many published reports are from developed countries where there are multiple studies on self-inflicted injuries, their risk factors and the socioeconomic

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impact of self-harm.<sup>6</sup> Whereas in underdeveloped or developing countries, self-inflicted injuries are not given priority because there is greater emphasis on trauma related to RTA as road traffic accidents are a major contributor to annual mortality.<sup>7</sup> When discussing intentional versus firearm injuries, several patterns of injury, site and types have been proposed. Factors that need to be kept into consideration include the triad of the environment (socio-economic environment, income disparity, and peer pressure), the individual (stability of mental health, previous behavioral patterns, personal nutrition) and the infrastructure (availability of healthcare resources, monitoring of at-risk groups and preventive counseling measures). All these factors can shape the pattern, type and extent of injury due to their interaction.<sup>8,9</sup> Therefore, there is a need to further assess how the demographic characteristics of affected individuals are related to patterns of injury. A more comprehensive study is required in this field, taking into consideration the risk of injury (like stress, multiple tours & homesickness), frequency of self-harm, type of injury and the cultural factors in order to provide a comprehensive picture of accidental and intentional injury patterns.

**METHODOLOGY**

This was a cross sectional study, taking sample of 64 patients. The study was conducted at Combined Military Hospitals Jhelum, Bannu & Kharian to describe the experience and management of non-suicidal self-inflicted versus accidental firearms injuries, outlining the patterns of injury sites, source and anatomical preference of these injuries. Non-probability consecutive sampling technique was used. Institutional consent was taken with Ref No. 1100/Adm dated 16 April 2021. CMH Kharian and informed consent was obtained. The injuries were determined to be either self-inflicted or accidental by an independent committee. Post-operative data was collected from the patients who had undergone surgery.

**Inclusion Criteria:** Individuals between the ages of 18-60 years, without comorbidity, and were able to speak and understand Urdu, Pashto and/or English were included in the study.

**Exclusion Criteria:** Patients who had more than one gunshot wound, or who had a previous gunshot wound within the past one year were excluded.

Data was collected using scale of self-inflicted firearm injury (SIFI),<sup>10-11</sup> and few open ended queries. A sample of 64 male respondent was recruited in this study. The bracketing was taken care of throughout the

procedures of data collection. Statistical Package for the social sciences (SPSS) version 20 was used for the data analysis purpose. The results obtained were categorized into four main categories that describe the patient’s self-inflicted injuries these categories are designed on the bases of patient (i) age (ii) site of injury (iii) presence of witnesses (iv) yearning for speedy recovery. Frequency and percentage were calculated for qualitative variables.

**RESULTS**

A sample of 64 male patients was included. Mean age was 40.23 ± 9.35 years (range 18-60 years). The individuals in the younger age group were emotionally immature as compared to older individuals who were more emotionally stable and this led to decreased number of injuries in elder patients. The individuals who harmed themselves chose the site of harm carefully. They usually selected the site that was non-lethal. The choice of site was also dependent on minimum handicap. The individuals who did self-harm usually did so in the absence of any witnesses. Accidental injuries were in the presence of two or more than two witnesses who could prove that the injuries were accidental. The individuals chose those sites for self-harm from where the recovery was easy and chose such timing that the recovery from the injury site was quick. The total proportion of accidental versus self-inflicted injuries were given in the Table, which indicated accidental gunshots were 52 (81.25%). The highest number of wounds in a single site was left leg and left arm.

**Table-I: Site of gunshot wound.**

Site	Accidental		Self-inflicted	
	Right	Left	Right	Left
Chest	5 (9.6)	(Spinal Cord/Back)	1 (1.5)	(Spinal Cord/Back)
Abdomen	7 (13.4)	= 2 (3.8)	-	=-
Thigh	5 (9.6)	3 (5.7)	-	-
Leg	3 (5.7)	8 (15.4)	-	6 (9.2)
Foot	4 (7.6)	2 (3.8)	1 (1.5)	3 (4.6)
Arm	3 (5.7)	8 (15.4)	-	-
Forearm	-	1 (1.9)	-	-
Hand	-	1 (1.9)	-	1 (1.5)
Total	52 (81.25)		12 (18.75)	

**DISCUSSION**

The study was conducted to observe the self-inflicted injuries, self-inflicted injuries showed a distinct pattern as compared to accidental injuries. The result of the study showed that accidental injuries involved either multiple sites or random ones; self-injuries showed deliberation was involved in choosing the site of injury and were clustered over a very small anatomical

area. Most participants who had inflicted these injuries were married, under stress of active duty and hoping to gain time off and associated benefits from the workplace. They were also conscious of choosing sites that afforded them the greatest mobility, least possibility of serious complications and earliest recovery.

Majority (80%) belonged to a low socioeconomic background and almost 60% were married. A significant proportion (30%) gave a history of previous self-harm and had other psychosomatic complaints. A history of previous psychiatric illness could not be obtained due to the stigma surrounding a clinical diagnosis of mental illness but patients objectively admitted to having depressive symptoms and suboptimal functioning in daily life.

All these variables contributed significantly to the respondent's decision to self-harm, but did not impair the deliberation of the injury site and consequences of said injury. Most self-inflicting respondents chose left leg as the site of injury due to being right handed (94%) and due to greater ease of access to injury site (left leg) minimizing the possibility of stray bullet injury or ricochet.

In comparison, abdomen and chest were significant sites for accidental injury 10% and 13% respectively. With the exception of right arm and right hand, all body sites were involved, recovery was complicated and recovery time was prolonged. There was significant restriction in movement and patients' main concern was prevention of mortality rather than early recovery.

Self-inflicted injuries are distinct from accidental injuries in their manifestation and ideation. These injuries have unique identifiers that can aid in their speedy identification and subsequent management.<sup>12-16</sup> Self-infliction is a full-fledged diagnostic category for DSM-5.<sup>17,18</sup> In our study, this signature "identifier" is a predominance of left-sided lower limb gunshot wounds in right-handed personnel.

Self-injuries constitute a growing but neglected epidemic in developing countries and contribute significantly to the global injury burden. In this study, most patients were males in their 20s and 30s. The question then arises of why such behavior prevails. Male predominance in this age group may be attributable to their active participation in risk taking behaviors and their frequent involvement in substance abuse in some areas.<sup>11</sup> Previous studies regarding self-inflicted injuries have shown that a history of a previous self-inflicted injury is a key risk factor for a repeat episode.

Similarly, psychiatric illness has also been reported to one of the strongest predictors of self-inflicted injuries.<sup>12</sup> Other predictors are comorbidities, terminal illness, poor quality of life or the prospect of receiving undue benefits.<sup>13</sup>

Our recommendation is that there should be the introduction of a screening system to identify at-risk persons using these predictors, a compulsory counseling service that can address these concerns when they are identified and a monitoring body that follows up on the prognosis of such cases. An internal audit of such behavioral patterns and the reasons for their occurrence can be greatly cost effective in terms of both manpower and healthcare resources utilized.

### CONCLUSION

Left lower limb and left foot was a more common site for self-injury as compared to the other sites.

**Conflict of Interest:** None.

### Authors' Contribution

SH: Direct contribution of conception of study, STAR: Direct contribution of conception of study, IA: Intellectual contribution of conception of study, RQK: Intellectual contribution of conception of study, WKN: Intellectual contribution of conception of study, ASR: Intellectual contribution of conception of study.

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