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Prevalence of death due to Firearm (Gunshot) injuries in Forensic Cases, in Kabul city, Afghanistan

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Abstract. Firearms (rifles, pistols, grenades, mines, and suicide bombers) cause gunshot injuries. In addition to destructive damage, the use of these weapons causes severe health damage, including bed sentences, disability, and death, which impose a heavy burden on the health sector and society with many adverse consequences for the social system. **Objective:** To assess the prevalence of deaths due to firearm injuries in the cases which were brought to the Kabul Forensic Medicine Center. **Methods and Materials:** This is a descriptive cross-sectional study. We have collected the data in a census manner from March 21, 2019, to March 19, 2020. We have retrieved the demographic information from the database of Kabul Forensic Medicine Center and analyzed it using SPSS version 26. **Results:** We went through the files and reviewed the demographic information of 1538 dead bodies which were brought to the Kabul Forensic Medicine Center, from March 21, 2019, to March 19, 2020, of which 466 (30.29%) were due to firearm injuries. Among those victims, 428 cases (91, 84%), were men, and 28 cases (8.16%) were female. The youngest age of the victims was 18 years and the oldest age of the victims was 40 years. The most common site of injury was the head (34.97%), and the most common cause of death was the destruction of brain tissue and severe internal and external bleeding (34.97%). The distance of gunshot was distant in most of the cases (52.78%). In most of the cases (69.74%), the type of wound canal originated with the exit wound. **Conclusion:** The death prevalence due to firearm injuries was 30.29%. Male, in the second, third, and fourth decades of life were victims in the majority of cases. In terms of anatomical location, the causes of death in most cases were firearm injuries to the head, destruction of brain tissues, and severe internal and external bleeding.

Keywords. Firearm injuries, deaths, forensic medicine, descriptive cross-sectional

1. Introduction

Firearms (rifles, pistols, grenades, mines, and suicide bombers) causes gunshot injuries. Firearm injuries are considered a major public health concerns [1]. Each year more than 250.000 people die from firearm injuries, the majority associated with homicide [2]. In addition to destructive damage, these weapons causes serious health damage, including bed sentences, disability, and death, which impose a heavy burden on the health sector and society and lead to many adverse consequences in the social system [3]. Injuries from firearms are a major problem even in modern and advanced countries like the USA [4, 5]. Understanding the nature and impact of the problems can be the first step in preventing firearm violence [6]. Similarly, the

availability and accessibility of illegal weapons such as rifles and other types of firearms to irresponsible individuals and criminals has led to serious security problems in Afghanistan, especially in the city of Kabul.

Due to the ongoing and prolonged war and illegal access of people to various types of firearms and their use in various terrorist, criminal and accidental events, firearm injuries have resulted in a high number of deaths and disabilities [7]. Thus, in most of the events like domestic violence, suicide, explosive attacks, rape, war, assault, air raids and suicide, these firearms are used illegally which leads to high number of deaths and increases other crimes in the society.

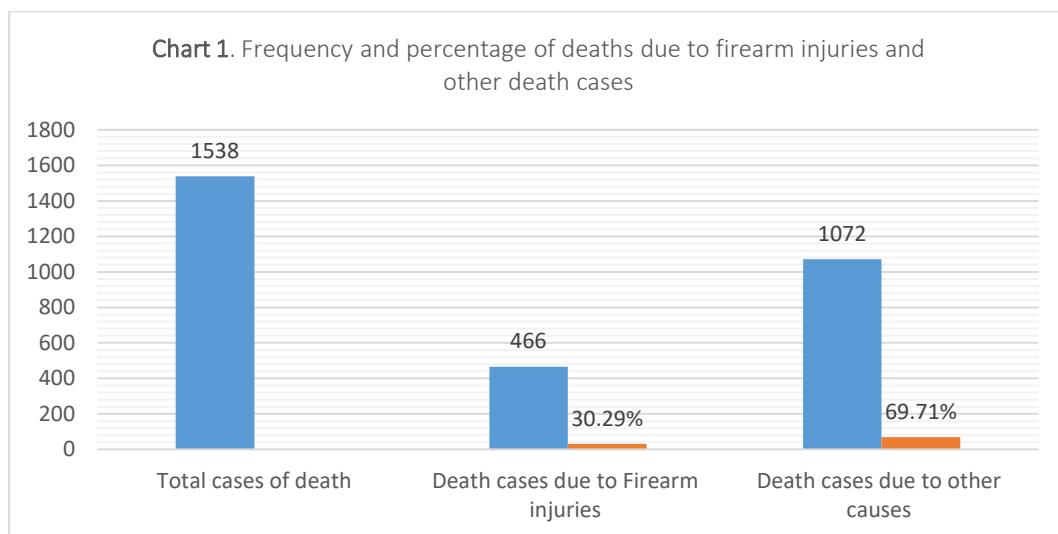
2. Methods and Materials

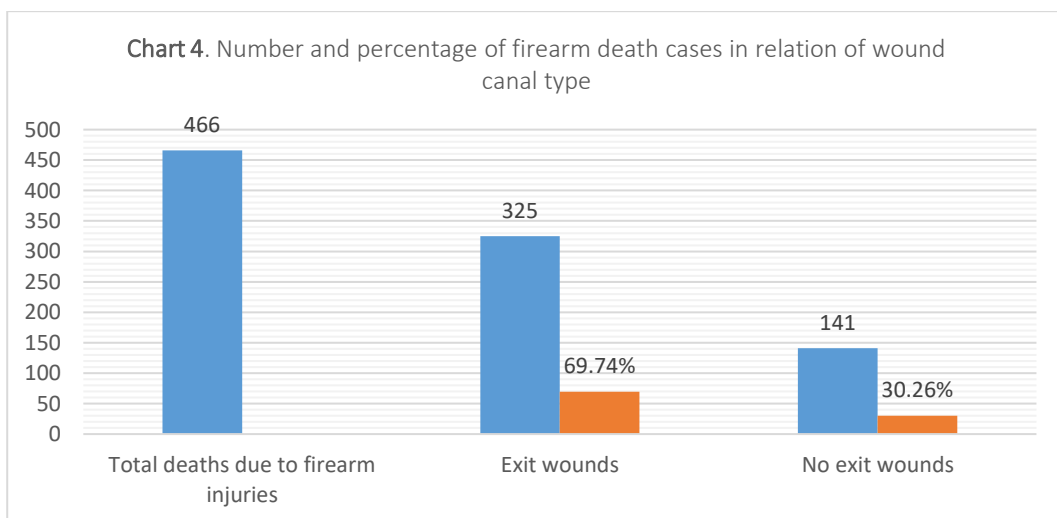
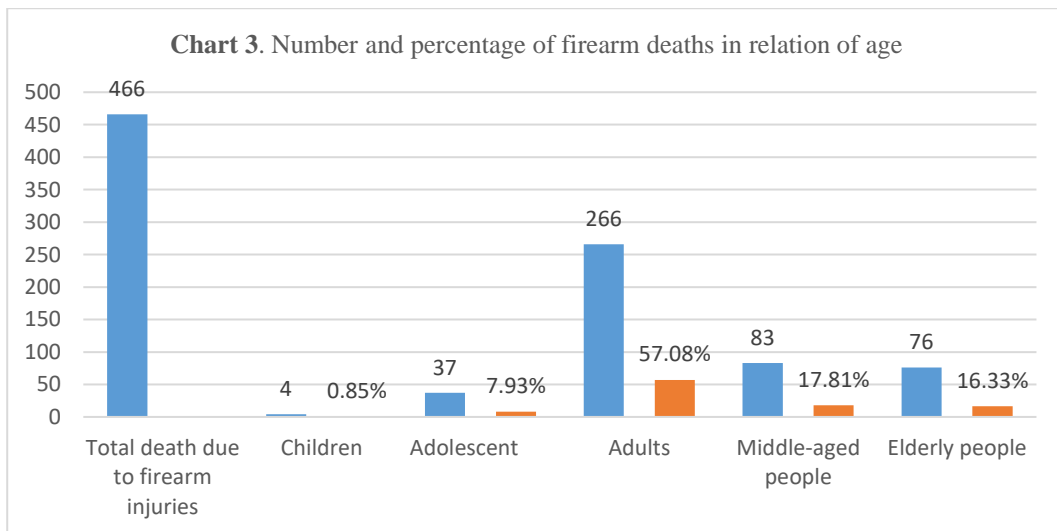
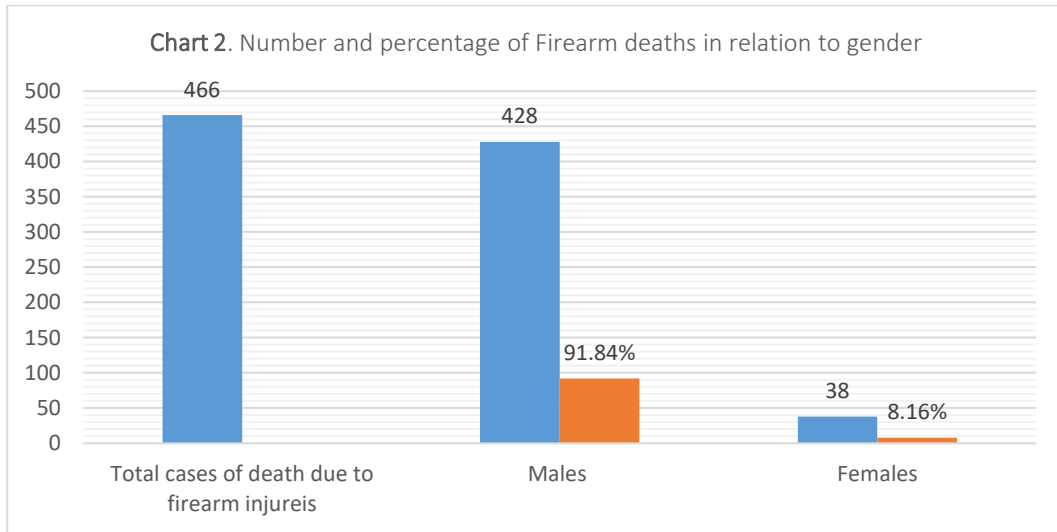
This is a descriptive cross-sectional study. We have collected the data in a census manner from database of Kabul Forensic Medicine Center from March 21, 2019 to March 19, 2020. The data then were analysed using SPSS version 26. Main variables of the study are age, sex, the anatomical site of gunshot injuries, cause of death, gunshot distance and type of injury canal.

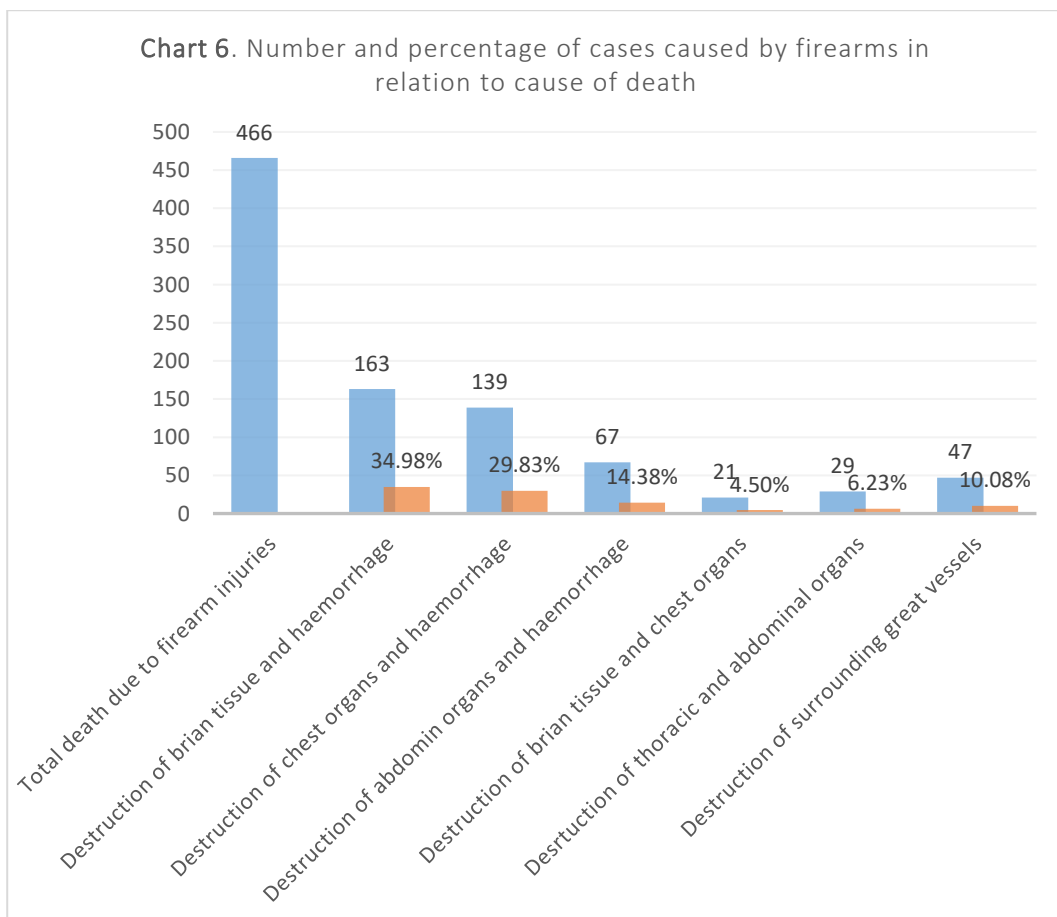
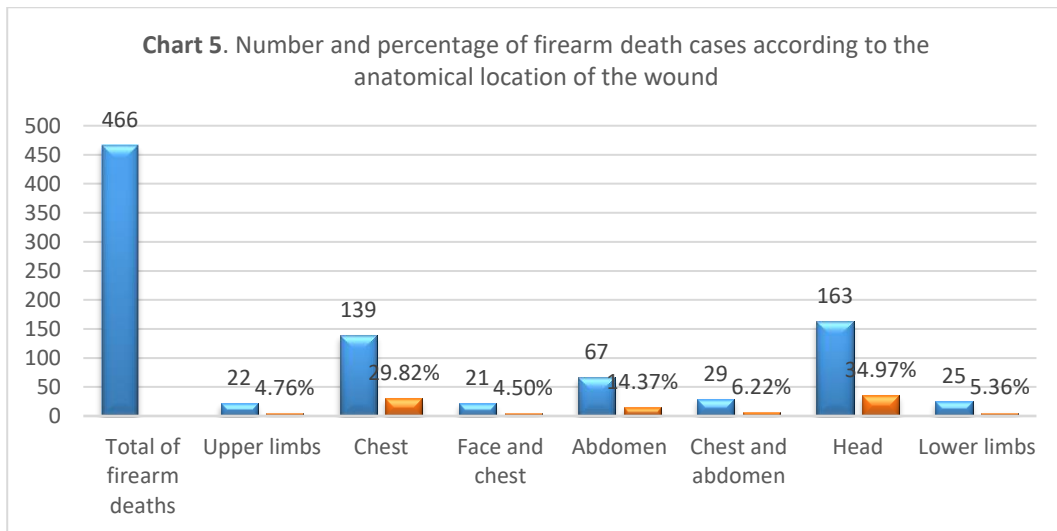
Facilities: Availability of data in the database of the forensic medicine centre.

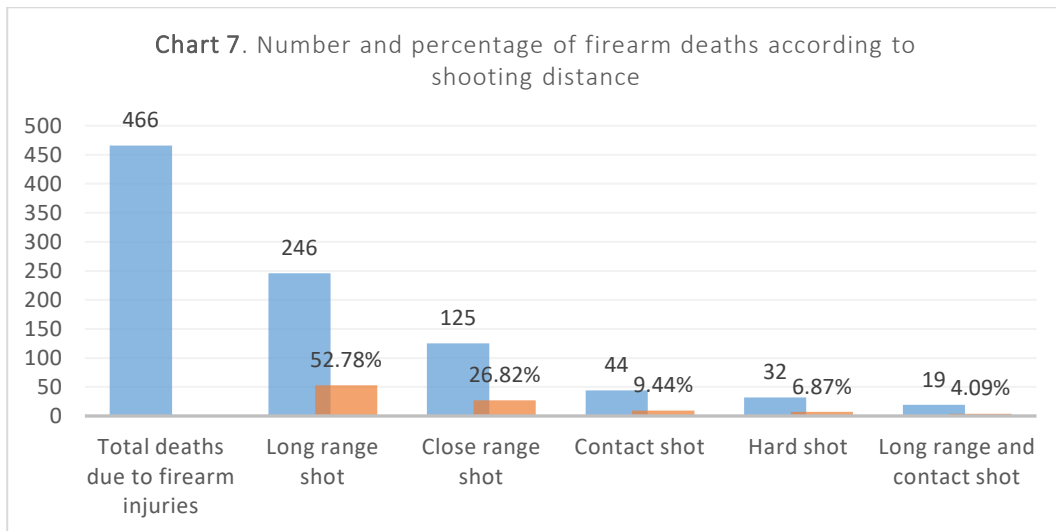
3. Results

The results of this study are illustrated and summarised in the following Charts.









4. Discussion

The aim of this study is to investigate the prevalence of mortality due to firearm injuries considering age, gender, anatomical location of injuries, cause of death, shooting distance, and type of wound canal. This study found that the prevalence of mortality due to gunshot injuries was 30.29%. The number of deaths was higher in males than females, most cases occurred in young people aged 18-40 years, the anatomical site of injury in most cases was the head, the cause of death in most cases was destruction of brain tissue, internal and external bleeding. Range of gunshot was distant in most cases and the type of injury canal found to be with an exit wound in most cases.

A retrospective study by Abeer-Mohammad Hargras and Magdy AAKharoshah in Egypt revealed that 268 cases of firearm injuries were reported to the Department of Forensic Medicine of the Ministry of Justice in the Suz Canal area from 2005 to 2010, of which 236 deaths were due to homicide, suicide and accidents, but 32 cases recovered with treatment. In majority of the cases i.e. 67 cases (25%), the anatomical site of injury was chest followed by head (14.8%), chest and abdomen (14.2%), mouth (2.6%), upper limbs (9%) and lower limbs (4.5%) [8]. In our study, in 163 cases (34.97%) the fire injuries involved the head, in 139 cases (29.82%) the chest, in 67 cases (14.37%) the abdomen, in 21 cases (4.50%) the face and chest, in 29 cases (6.22%) the chest and abdomen, in 22 cases (4.76%) the upper limbs, and in 25 cases (5.36%) the lower limbs. Regarding age, most cases were reported in young people in the third decade, followed by most cases in the second, fourth, fifth and sixth decades, and there were less 2 cases in people over 60 years old [8]. Our study showed a similar result, most cases of firearm injuries occurred in young people (18-40 years old). Most cases in Egypt involved males compared to females, with a male to female ratio of 28.8:1 [8]. which is very close to the results of this study, which shows that in 91.84% of cases, the victims were males.

Another retrospective study conducted by Azam Khan Khetran et al. in Baz Khan region of Balochistan province of Pakistan revealed that between 2007 and 2010, about 268 death cases due to firearm injuries were reported in Baz Khan hospital of Balochistan province and majority of the cases namely 264 cases (98.51%) were males and only 4 cases (1.49%) were females. In most of the cases, the victims were aged between 31-40 years and most of the cases occurred in the morning. It was also found that in most cases (57.09%) the anatomical location of the bullet was the chest, (25%) the head and (17.91%) the upper and lower extremities. In

219 cases, the victims died at the scene, while in 43 cases they died on the way to the hospital and in 6 cases death occurred during treatment [9].

Another retrospective study by Sithu Myintand and others in Thailand showed that out of 7126 autopsies between 2002 and 2011, 149 cases (2.09%) were due to firearm injuries. Among these victims, 136 cases (91.3%) were males and 13 cases (8.7%) were females. The youngest victim was 10 years old and the oldest victim was 79 years old. The average age of most victims was 30 years old, which means that most cases were reported among young people. It was shown that most of the cases took place outside the home and most of them were in the form of homicide. As for the anatomical location, the bullet hit the head, face and chest. Laboratory tests were done in 122 cases and alcohol was detected in blood in 38 cases and other narcotic substances were detected in blood and urine in 11 cases [10]. In our study we could not find anything about the laboratory results.

Another retrospective study conducted by Recep-fedakar and Nursel-Turkmen in the industrial area of Turkey showed that from January 1999 to the end of 2003, 3463 autopsies were performed in the forensic department of Barça and Coca, it was found that the majority of cases (82.2%) were men and (17.8%) were women and it was also found that in 51.3% of cases the age was between 21 and 40 years ⁵, which is very similar to our results in terms of gender and age. they were able to determine the type of weapon, an issue that was not found in this study. it was found that in (39.2%) of the cases the bullet hit the head. In 73.4% of the cases, the bullet was shot from a distance [11].

In another study, A. Amiri and colleagues investigated 89 deaths due to firearm injuries in Tehran Medical Justice Center from March 2002 to March 2003, and found that (60.7%) of these cases were homicides, (13.3%) were suicides, (4.5%) were accidents, and (4.5%) were unclassified cases. The majority of victims were young and male. In most homicides, the lethal weapon was a military weapon, but in most suicides, the weapon used was a handgun. In most suicides, the bullet lodged in the chin (37%) and chest (25.9%). In 42.6% of the homicides, the bullet hit the head [12].

BP Sing, found out that 139 cases of death due to firearm injuries from 1980 to 2000 in different parts of India were reported. He found that most of the victims were young men aged 26 to 30 years, most of them farmers, and that the head and chest were the most commonly affected anatomical area [13].

In a descriptive study by Zahid Hussain and colleagues, it was found that 452 deaths due to gunshot wounds were reported in 2004 at Khyber Medical College in the Pakistani city of Peshawar. The male to female ratio in this study was 5.5:1 and in most cases the wound was in the head, face and neck [14].

Another study at the same centre (Khyber Medical College) from June 2005 to February 2006 found that 100 gun deaths were recorded, with a male to female ratio of 6:1. Chest, head and abdomen were the most common wound sites [14].

Osama Al Madni and colleagues reported 64 deaths due to firearm injuries from January 2002 to December 2006 in Saudi Arabia, with 59 cases involving young males and the area of gunshot being distant. The head and chest were the most commonly affected anatomical sites [15].

Comparing the results of this study with the literature, it was found that in terms of sex and age, most cases of gunshot injuries occurred in males than females and young people, which is consistent with the previous studies. In terms of anatomical location of injuries and cause of death, in this study, most cases involved the head and destruction of brain tissue was the cause of death, which is consistent with previous studies. Similarly, in this study, it was found that

the shooting distance was far in most cases, which is consistent with the study conducted by Recep-fedakar and Nursel-Turkmen in Turkey. Also, in this study, it was found that the wound canal was mostly with an exit wound, which was not observed in other literature.

5. Conclusion

Considering the above findings, we concluded that the prevalence of death due to firearm injury is 30.29%, with a higher number of cases in males than females. The cause of death in the majority of cases due to firearm injuries was brain tissue destruction, internal and external bleeding. In this study, the anatomical location of gunshot injuries in the majority of cases was the head and that most cases of gunshot injuries occurred in young people aged 18-40 years. Physical examination also revealed that the gunshot distance was distant and the wound canal was with the exit wound in majority of the cases.

6. Suggestions

- Disarming insurgents and irresponsible persons is very important.
- Preventing the sale and purchase of illegal weapons throughout the country should be encouraged.
- Detailed and comprehensive examinations of dead bodies by forensic experts, especially in conjunction with security sector investigations, are essential.
- Updating and improving the professional knowledge of forensic medicine department staff is necessary.
- Establishment of forensic medical centers in other parts of the country to investigate cases caused by firearm injuries and other forensic cases.
- Establishment of well-equipped forensic medical centers in all parts of the country.

Conflicts of interests

The authors declared that there is no conflict of interests. Every author take part equally in the research and the final version of the manuscript was approved by the all the three authors.

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