

ORIGINAL ARTICLE

INCIDENCE OF FIREARM-RELATED DEATHS AND EPIDEMIOLOGY IN KLANGVALLEY, MALAYSIA FROM 2006 TO 2016: A RETROSPECTIVE STUDY

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ABSTRACT

Death due to firearm is more common in countries with higher gun ownership such as United States of America compared to countries with restrictive gun ownership such as European countries and Malaysia. However, the increasing number of shooting cases in Malaysia recently should not be overlooked. This study was carried out to investigate the incidence of firearm-related deaths and epidemiology in Klang Valley for 11-year period. The demographic data on the incidence of firearm-related deaths from 2006 to 2016 was collected retrospectively from four government hospitals in Klang Valley. 204 cases of firearm-related deaths were reported with irregular trend of the incidence throughout the 11-year period. The results revealed that most victims were male, aged between 30 to 34 years old and Malaysian citizen. Firearms fatalities were higher among Malaysian specifically Indian, as compared to non-Malaysian. Most firearms fatalities were homicides and took place during late night between 12.00 am to 5.59 am. The highest cause of death was head injury due to gunshot wound. It is hoped that this study will raise awareness to Malaysian citizen regarding firearm-related cases and to develop strategies to overcome the issue of gun violence in Malaysia with appropriate authorities.

Keywords: firearm fatalities, firearms epidemiology, firearms demographic data, gun violence Klang Valley, gunshot wound

INTRODUCTION

A spate of shooting cases particularly street killings had sparked fear and caused concern among public as the risk of injuries and fatalities due to firearms would not only affect the targeted person, but might harm innocent people due to misfire or stray bullets. In 2016, there had been more than 10 cases of shooting occurred in Malaysia¹. This suggested that gun violence in Malaysia is alarming and the public should be concerned. Gun violence in Malaysia is often linked with violent crimes such as murder and robbery. These crimes mostly happened in urban areas where the population is higher which led to higher human interaction, more opportunities for crime and formation of gang or criminal groups². Basically, crime rate increases faster as the number of member of society increases.

The predominant influencing factor in firearms injuries is gun availability. In the United States of America (USA), the firearms incidence is higher due to greater firearm ownerships, whether legally or illegally through gun trafficking³ and lesser firearms restriction⁴. Furthermore, keeping firearms at home

for protection is common in the USA⁵. However, instead of using firearms for protection, availability of firearms at home increased risk of death⁵. According to Ayesha et al., about 31,076 American died in 2010 were due to homicidal, suicidal and unintentional shootings⁶. Higher gun availability in certain cities resulted in higher rates of gun assault and gun robbery⁷. Branas et al. stated that gun possession by victims during an assault increased the risk of getting shot as they might encounter dangerous environments and conflicted with similarly armed assailants⁸. Unlike at the European countries, firearm fatalities were lower^{9,51} because strict firearms legislation was implemented¹⁰.

In Malaysia, the use of firearms in crimes is not very common compared to the USA and the European countries. Mohammad Rahim et al. noted that criminals frequently used knives in violent crimes rather than firearms due to restrictive gun ownership in Malaysia¹¹. Malaysian Arm Act 1960 is strict and any person, who possesses arms or ammunition for unlawful purpose shall be prisoned, fined and whipped¹². Although people were not commonly injured or killed by firearms in Malaysia¹¹, gun violence in Malaysia should not be

underestimated. In fact, the rise of shooting cases recently was not captured because no data or research has been done before. Therefore, this study was carried out to investigate the firearm-related deaths and epidemiology in Klang Valley, Malaysia, from 2006 to 2016. Moreover, it aimed to elucidate the trend of firearm-related deaths in Klang Valley for the 11-year period, to investigate the epidemiology of firearm-related deaths by demographic data of the victims, manner of death, time of death and site of injury.

Klang Valley was chosen because it is the busiest region in Malaysia due to its high population densities, cultural hub and main centre for economic activities¹³. According to Department of Statistics (2016), total population of Malaysia in 2016 is estimated at 31.7 million¹⁴ and Klang Valley contributed to the Malaysia’s population by an estimated population of 7.2 million persons in 2016¹⁵. The outcome of this study is expected to increase public awareness regarding the status of firearm-related deaths in Klang Valley.

MATERIALS AND METHODS

Firearm-related deaths’ data were collected from the post mortem registry book in the Forensic

Department of four hospitals in Klang Valley from 2006 to 2016: Pusat Perubatan Universiti Kebangsaan Malaysia, Hospital Tengku Ampuan Rahimah, Hospital Sungai Buloh and Hospital Serdang. Demographic data of the victims including gender, age, nationality and ethnic group, with data on manner of death, time of death and site of injury were recorded. The summary of the data collected in this study are listed below:

1. Total number of firearm-related deaths
2. Demographic data of victims (gender, age, nationality, ethnic group)
3. Manner of death
4. Time of death
5. Site of injury

RESULTS AND DISCUSSION

1. Total number of firearm-related deaths in Klang Valley from 2006 to 2016

A total of 204 cases of death due to firearms were reported in Klang Valley from 2006 to 2016. The highest fatalities were recorded in 2009 with 43 cases (21.1%) followed by 39 cases (19.1%) in 2008. The least number of fatalities was recorded in the year 2007 with only 4 cases (Table 1).

Table 1: Total number of cases for firearm-related death in Klang Valley, 2006-2016

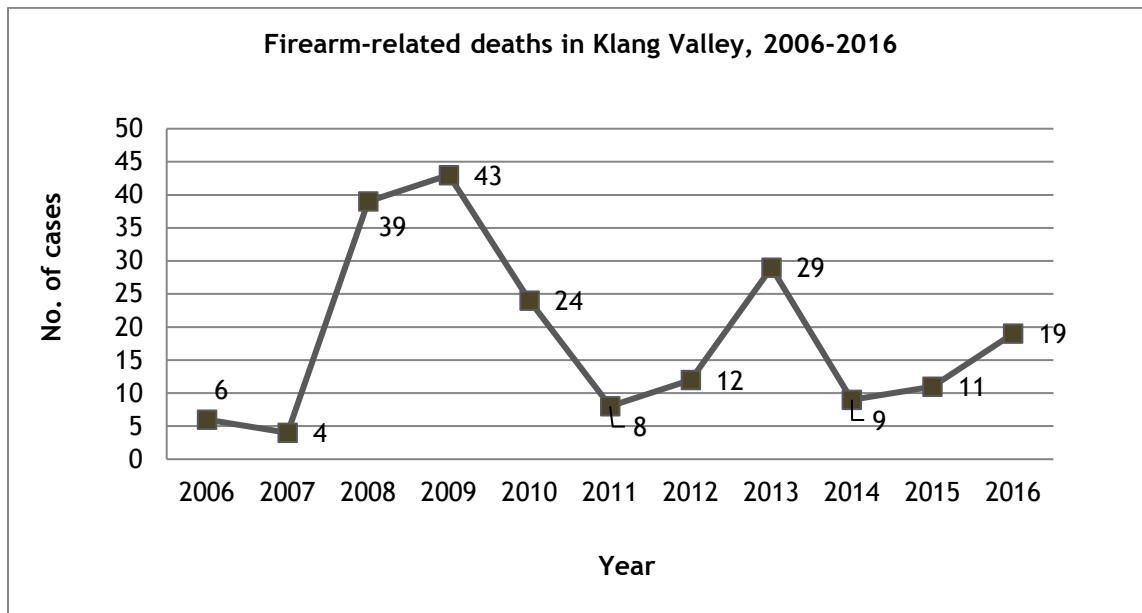
Year	Number of cases	%
2006	6	2.9
2007	4	2.0
2008	39	19.1
2009	43	21.1
2010	24	11.8
2011	8	3.9
2012	12	5.9
2013	29	14.2
2014	9	4.4
2015	11	5.4
2016	19	9.3
Total	204	100

2. Trend of firearm-related deaths in Klang Valley from 2006 to 2016

An irregular trend was recorded for firearm-related deaths in Klang Valley throughout the 11-year period. As shown in Figure 1, there was a fluctuation

in the number of cases as shown by the consecutive up and down pattern in the trend. The reason for this fluctuation was not captured from this research because this was a preliminary project.

Figure 1: Firearm-related deaths in Klang Valley from 2006 to 2016



3. Demographic data of the victims

Out of 204 cases, only 199 cases have complete demographic data of the victims. 5 cases were unachievable due to decomposed victims.

i. Gender

Males were major gunshot victims (96%) in Klang Valley with a male to female ratio of 27:1. This finding was similar to previous studies conducted in Egypt^{9,16,17,18}, England¹⁹, India²⁰, Germany²¹ and Nigeria²². The predominance of males in firearm fatalities was also reported in the Transkei region of South Africa²³, Thailand²⁴ and other studies around the world²⁵. This shows that males were common for victimization in firearm-related deaths²⁶.

Hagras and Kharoshah stated that male constituted the highest fatalities because they were more exposed to violence⁹. As males were often stay outdoors to work and challenged with stressful conditions²⁴, they might engage in fights which could lead to death⁹. Males were also known to be aggressive which makes them prone to violent injuries. They are also more likely to get involved in organized crime, gang fight and drug smuggling which could eventually led to firearm fatality²⁴. On the other hand, females tend to avoid any fight that

could lead to danger and often stay indoors. This makes them less likely to be involved in any violence and less victimized in firearm fatalities compared to male⁹.

ii. Age

The age of the victims ranged between 15 years old to 64 years old. The highest frequency (38 cases; 20.5%) was recorded in 30 to 34 year-old age group followed by 36 cases (19.5%) in 25 to 29 years age group (Table 2). The lowest fatalities were recorded in 60 to 64 years age group (2 cases). Males were the major gunshot victim as compared to females in all age group (Figure 2). For this parameter, 14 cases did not provide complete information on the age of the victims, hence, they were excluded.

Victims in the 30 to 34 age group were more affected due to their aggressiveness²⁷ and highest involvement in outdoor events which making them more prone to injuries²⁸. Moreover, a previous study had also reported that majority of the victims in firearm-related deaths were adult and middle aged people²⁹. Previous study conducted by Ojo et al. reported that victims aged between 20 to 40 years were more affected because they were the most active and productive population of the society³⁰.

Figure 2: Distribution of gunshot victims according to age group between male and female from 2006 to 2016

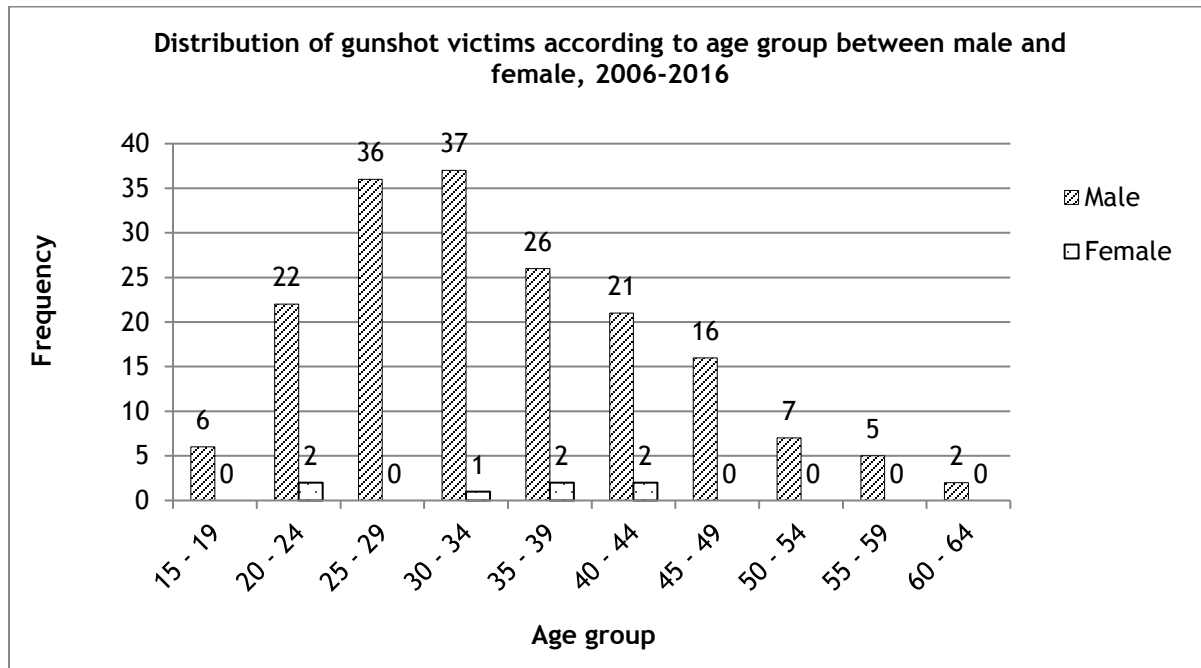


Table 2: Distribution of gunshot victims according to age group from 2006 to 2016

Age Group	Total	%	Male	Female
15 - 19	6	3.0	6	0
20 - 24	24	13.0	22	2
25 - 29	36	19.5	36	0
30 - 34	38	20.5	37	1
35 - 39	28	15.0	26	2
40 - 44	23	12.0	21	2
45 - 49	16	9.0	16	0
50 - 54	7	4.0	7	0
55 - 59	5	3.0	5	0
60 - 64	2	1.0	2	0
Total	185	100	178	7

Studies conducted in Italy³¹ and United States of America^{32,33} had reported that the commonest age groups in firearm-related death were 21 to 30 years and 31 to 40 years because people at these years of age were more aggressive than older people. Hence, they could easily engage in a fight and conflict as well as be in gangs and involved in drug dealing²⁴. The age between 21 to 40 years was also a working age in which the people in that age group were handling stressful situations in their daily

activity²⁴. This group of people tend to stay outdoors longer to pursue their work and they were more short-tempered compared to the older age group⁶. In the present study, firearms fatalities decreased from 40 years old and above until 60 to 64 years band which accounted for the least fatalities. These findings were supported by Lemard and Hemenway³⁴ and Gamal et al.³⁵.

Contrary to the finding in the present study, Ayesha et al.⁶ and Murad and Muhammad Zahid³⁶ noted that people at age group of 21 to 30 years were mostly affected in firearm-related deaths in Pakistan. Similarly, studies in Africa³⁷, USA³⁸ and Brazil³⁹ reported that the younger age group were more affected due to social setup of the society in those countries. In societies which kids become independent at an earlier age, the involvement of youth in violence was more common.

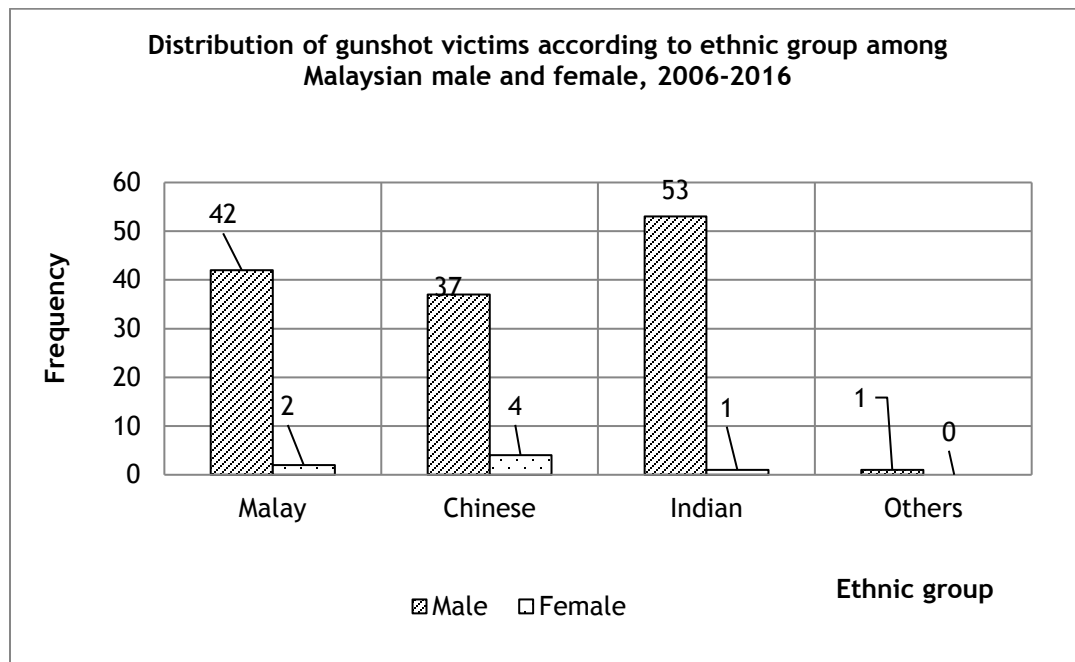
In this study, the highest fatalities of females were noticed in age group of 20 to 24, 35 to 39 and 40 to 44 years (2 cases per group). Females in these age groups were more affected than other age groups because they might stay outdoors longer for work⁶.

iii. Nationality and Ethnic groups

As shown in Table 3, firearms fatalities were higher among Malaysian (140 cases; 70%) compared to non-Malaysian (55 cases; 28%) throughout the 11-year

period. Among Malaysian victims, Indian constitutes the highest firearms fatalities (54 cases) followed by Malay (44 cases) and Chinese (41 cases). Only 1 case of firearm fatality was recorded from other ethnic group. Males were the major gunshot victim as compared to females in all ethnic (Figure 3). For non-Malaysian, majority (52 cases) of the victims were Indonesian, while only 1 case for Liberian, Singaporean and Columbian. Malaysian was more affected in firearm-related deaths compared to non-Malaysian because of major population in Malaysia¹⁴. This finding was supported by Sidhu who revealed that Malaysian committed more crimes than foreigners⁴⁰. Among Malaysian, Indian constituted the highest number of fatalities among all ethnic groups in Malaysia. This was due to a higher involvement of Indian in gang related activities and serious crimes such as murder, rioting and robberies⁴⁰.

Figure 3: Distribution of gunshot victims according to ethnic group among Malaysian male and female from 2006 to 2016



As for non-Malaysian, most victims were Indonesian. The population of Indonesian people in Malaysia is quite high represented by more than 50% of foreign workers from Indonesia in 2008⁴¹. Tunira stated that immigrants from Indonesia migrated to Malaysia to become labourers, domestic workers, professional workers or businessman⁴². The influx of Indonesian immigrants in Malaysia had caused some of them, particularly illegal workers to engage in criminal activities⁴⁰. Thus, their involvement in crimes or

fighting associated with guns might eventually lead them to be killed during the conflict⁴⁰.

4. Manner of Death

Homicide was the highest manner of death (108 cases; 97%) as compared to accidental (2 cases, 2%) and suicidal death (1 case, 1%) based on 111 cases recorded. A total of 88 cases did not have information on the manner of death and therefore, were excluded. The highest incidence of homicidal death in this study was in agreement with previous

studies conducted in Egypt⁹, Iran⁴³, Turkey²⁵, Saudi Arabia⁴⁴ and Italy³¹ which reported that most of the firearms fatalities were homicides. However, Thomsen and Albrektsen⁴⁵ and Norton and Langley⁴⁶ found that suicides were the most frequent manner of death in firearms cases in Denmark and New Zealand due to firearms availability at home.

Homicidal deaths were more frequent due to high firearms ownership⁹. According to Powell et al., gun

possession is the major risk factor for firearms fatalities⁴⁷. However, due to strict firearm ownership in Malaysia¹¹, the predominant incidence of homicidal deaths might be due to illegal firearm ownership which was most probably obtained through black market²⁴. Suicidal deaths accounted for the lowest incidence because suicide using firearms was less preferred compared to poisoning and hanging which are the most common method for suicide in Malaysia⁴⁸.

Table 3: Distribution of gunshot victims according to nationality and ethnicity from 2006 to 2016

Nationality & Ethnic Group	Frequency	%	Male	Female
Malaysian				
Total	140		133	7
Malay	44		42	2
Chinese	41	70	37	4
Indian	54		53	1
Others	1		1	0
Non-Malaysian				
Total	55		55	0
Liberian	1		1	0
Indonesian	52	28	52	0
Singaporean	1		1	0
Columbian	1		1	0
Unknown	4	2	-	-
Total	199	100		

5. Time of Death

Majority of firearm-related deaths took place during late night between 12.00 am to 5.59 am (55 cases, 30%) followed by evening with 47 cases (26%) as

shown in Table 4. Out of 199 cases, there were 18 cases which the time of death was not known and thus, excluded for analysis.

Table 4: Firearm-related deaths according to time of death from 2006 to 2016

Time of Death	Frequency	%
Morning (6.00 am to 11.59 am)	34	19
Afternoon (12.00 pm to 5.59 pm)	45	25
Evening (6.00 pm to 11.59 pm)	47	26
Late Night (12.00 am to 5.59 am)	55	30
Total	181	100

*18 cases of unknown time of death were excluded

Hagras and Kharoshah⁹, Myint et al.²⁴, Pattarapanitchai and Riengrojpitak⁴⁹, and Mohanty et al.⁵⁰ also reported findings similar to current study. The most common period for firearm-related deaths in this study was between 12.00 am to 5.59 am. Causal relation between times and manner of death were not captured in this study however Myint et al. noted that non-suicidal case of fatal firearm-related death was higher at night (in Bangkok). They also found that most violent crimes occurred at night because people tend to feel agitated and easily provoked leading to violence during this time due to exhaustion from work²⁴.

Moreover, most illegal activities happened at night because the darkness of night gave advantage for assailants to disappear after committing a crime²⁷.

6. Site of Injury

Most victims (86 cases; 59%) died due to a single bullet injury rather than multiple injuries (Table 5). The most affected area in single bullet injury was the head (35 cases), followed by chest (34 cases). In multiple injuries, the highest site of injury (26 cases) among gunshot victims was head and chest. There were 54 cases of which the site of injury was not stated and thus, excluded for analysis.

Table 5: Firearm-related death according to site of injury from 2006 to 2016

Site of Injury	Frequency	%
Single		
Total	86	59
Heart	3	
Chest	34	
Head	35	
Abdomen	4	
Neck	3	
Pelvis	3	
Intra-abdominal	1	
Back	1	
Trunk	1	
Thoraco-abdominal	1	
Multiple		
Total	59	41
Chest & Abdomen	4	
Head & Chest	26	
Head, Chest & Abdomen	5	
Face & Chest	1	
Head & Intra-abdominal	1	
Head, Neck & Chest	1	
Neck, Chest & Abdomen	1	
Head & Neck	1	
Chest & Neck	1	
Head & Abdomen	1	
Heart & Spine	1	
Neck, Chest & Groin	1	
Heart & Liver	1	
Not stated	14	
Total	145	100

In this study, the most common site of injury was head followed by chest. This finding complied with previous studies conducted in Thailand²⁴, Saudi Arabia⁴⁴ and Italy³¹ which reported that most victims died due to gunshot wound of the head. According to Ayesha et al.⁶, head was mostly

targeted in homicidal deaths because injuries to that area were usually fatal. However, Hagras and Kharoshah⁹, Saleh¹⁸, Gamal et al.³⁵, Azmak et al.²⁵ and Murad and Muhammad Zahid³⁶ reported the opposite. Based on their studies, chest was the most common site of injury instead of head and homicide

was the highest manner of death in fatal gunshot wound to the chest⁹.

There were limitations noted in this research. First, the data was limited as it only contained the victim's information. The epidemiology of the incidence can be investigated extensively if assailant's information were also available. Since assailants' information is only available to police officers and confidential, it is important to develop collaboration with the law enforcement agencies. Nonetheless, for this study, data collection from the hospitals was sufficient to demonstrate the demography of the victims. Secondly, cases that were not sent to the selected hospitals were not included in this study. However, since the selected hospitals were the main hospitals in Klang Valley, the majority of firearm-related deaths that occurred in Klang Valley for the selected period have been reported thoroughly. Finally, there were few excluded cases due to unidentified decomposed victims, which is unavoidable.

As a recommendation, future study on firearms fatalities in Malaysia should include assailants' information and the relationship between the assailants and victims. Furthermore, the occupation of the victims and assailants are to be sought to provide more information about the risk factors of firearm-related deaths in Malaysia. Apart from that, for further research on firearms fatalities in Klang Valley, it is recommended that the research includes data collection from all hospitals in Klang Valley to ensure that the incidence and its epidemiology is investigated thoroughly. Finally, although Malaysia has a strict firearm legislation, research on the relationship of gun ownership and gun violence could be conducted to demonstrate the exact status of gun violence in Malaysia.

CONCLUSION

In this retrospective study, firearm-related deaths in Klang Valley were highest in 2009 and the trend of the incidence was irregular for the 11-year period. The demographic data revealed that most victims were males, Malaysian citizens and aged between 30 to 34 years old. Among Malaysian, Indians had the highest fatalities while Indonesian constituted the highest deaths among non-Malaysian. Most firearms fatalities were homicidal deaths and took place during late night from 12.00 am to 5.59 am. Most died because of single gunshot injury to the head.

In summary, data on firearm-related deaths and epidemiology was obtained from this research. The

risk factors and groups of society that were most likely to be affected in firearm-related deaths have been identified by demographic data. The outcome could assist the government and relevant authorities to plan for superior solution to resolve the issue of gun violence and firearm-related deaths in Malaysia such as increasing supervision along country border where firearms are often smuggled and illegally purchased.

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