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Trauma Profile of Homicide Victims at Dr. Soetomo General Academic Hospital, Surabaya, during the COVID-19 Pandemic

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ABSTRACT

Introduction: The injuries of homicide victims are clues in forensic medicine to uncover a possible crime. In Indonesia, there are not many studies on trauma profiles, specifically in homicide cases. This study aimed to provide an overview of the trauma profile of homicide victims at Dr. Soetomo General Academic Hospital, Surabaya, from January 2020 until December 2021.

Methods: This was a descriptive study. Secondary data was collected from 34 forensic examination reports at Dr. Soetomo General Academic Hospital, Surabaya. Data such as age, sex, type of injury, sites of injury, number of injuries, cause of death, and mechanism of death were analyzed statistically.

Results: Most victims were between 21 and 30 years old and 31 and 40 years old (26.47%). Sex was dominated by men (76.47%). The most common type of injury was abrasion (25.71%). The most common injury sites were head-neck (34.34%) and chest-upper back (34.34%). The most common number of injuries was ≥10 (44.12%). The most common cause of death was sharp-force trauma (54.54%), and the most common mechanism of death was exsanguination (54.54%).

Conclusion: Males predominated in the age ranges of 21 to 30 years old and 31 to 40 years old. The most common type of injury was abrasion. The most common sites of injury were the head, neck, and chest upper back. The most common number of injuries was ≥10. Most victims died of sharp-force trauma. Exsanguination was the most common mechanism of death.

Highlights:
1. Most homicide victims were predominantly in the productive age range of 21-40 years old.
2. Males were more likely to be homicide victims than females.

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Introduction

Trauma or injury in medicine means loss of continuity of tissue, whereas, from a medicolegal aspect, trauma is knowledge about tools or objects that can cause health problems to someone. In forensic medicine, trauma is a clue in an act of violence. Clarity is needed in knowing the type of trauma, the tools used, the estimated age of a wound, and the degree of the wound. For a person with suspicion of criminal act involvement, it is necessary to determine the cause of death by examining the trauma that was present in the victim through autopsy.[1]

Murder is classified as a crime against life, which is one of the highest hierarchical crimes in the international crime classification, as well as a crime with the most severe punishment in the Indonesian Criminal Code. In international law, stated in the Rome Statute of the International Criminal Court article 7 paragraph 1, murder is classified as a crime against humanity along with other crimes such as slavery and torture.[2]

Based on data compiled by the National Central Bureau of Statistics on the number of murder cases in Indonesia from 2018 to 2021, there was a decrease in the number of cases from 2018 to 2020, then an increase in 2021. In 2018, there were 1,024 cases, in 2019, there were 964 cases, in 2020, there were 898 cases, and in 2021, there were 927 cases. For East Java, there was a decrease in the number of cases from 2018 to 2021. In 2018, there were 72 cases, in 2019, there were 65 cases, in 2020, there were 55 cases, and in 2021, there were 55 cases.[3,4]

In 2017, a study was conducted on the autopsy profile of unnatural death cases at Dr. Soetomo General Academic Hospital, Surabaya. Between January 2014 and December 2016, 70 victims died unnaturally. A total of 38 victims died unnaturally as a result of murder. The most common types of fatal wounds were fractures found in 17 bodies. Most of the dead bodies were in region 2 (front neck, chest, and stomach) found in 28 bodies. The cause of death was mostly due to blunt force trauma found in 34 bodies. The mechanism of death was mostly due to asphyxia, which was found in 50 bodies.[5]

Another study on homicide trends in Central Bangkok showed that there were 119 cases of homicide out of a total of 3,430 cases of unnatural deaths collected from 2009 to 2013. 101 of the victims were men and the remaining 18 victims were women. The most common cause of death was due to gunshot wounds which were found in 45 cases. The most injured region was the head region in 46 cases.[6] In Pondicherry, India, a study was conducted on homicide cases where there were 85 homicide cases out of a total of 1,994 cases that underwent autopsies at a private medical college from 2004 to 2006. The most common type of trauma was trauma due to sharp objects found in 37 cases and regions. The most injuries were in the neck region in 37 cases.[7]

The COVID-19 pandemic has resulted in some people experiencing economic problems due to losing their jobs. Economic problems can be one of the factors that increase crime rates. Another one is the socio-environmental factor, where groups could be formed between people with the same economic problem and then could encourage each other to make decisions to commit crimes during the COVID-19 pandemic.[8]

According to the East Java Central Bureau of Statistics, only 21 homicide cases were reported for 2020 and 19 for 2021 in East Java. These results are not aligned with what was reported by the National Central Bureau of Statistics. For Surabaya, 2 reported cases in 2020, and no data was found for 2021.[9] These results are very different from what this study has discovered, considering this study only acquired data from one forensic institution.

There has been no research on the trauma profile of homicide cases during the COVID-19 pandemic in Surabaya. There is a lack of data synchronization between the national and provincial statistic bureaus. Therefore, this study was performed to update data on homicide cases, trauma profiles, and causes of death at the Installation of Forensic Medicine and Medicolegal Dr. Soetomo General Academic Hospital, Surabaya, during the COVID-19 pandemic.

Methods

This was a descriptive study. Secondary data were collected from the forensic examination reports of unnatural deaths at the Installation of Forensic Medicine and Medicolegal Dr. Soetomo General Academic Hospital, Surabaya. A non-random technique was used to obtain the data needed for analysis. To collect the data required, the case numbers for all homicide victims from 2020 until 2021 were first collected to ease the archive navigation. Then, the archive was searched for the examination reports correlating with the case number.

The independent variables that were collected from each of the examination reports in this study were age, sex, type of injury, sites of injury, number of injuries, cause of death, and mechanism of death. The dependent variable was forensic examination reports of unnatural deaths at the Installation of Forensic Medicine and Medicolegal Dr. Soetomo General Academic Hospital, Surabaya, from January 2020 until December 2021. All available independent variables from each victim were noted and statistical analysis was performed for each independent variable. All independent variables were input into Microsoft Excel 2016 and each of the available independent variable for each victim were laid out and categorized based on the majority of the available data.[10] Each independent variable was then analyzed to find the percentage of each variable. This study was conducted after receiving ethical clearance from the Ethics Committee for Health Research Dr. Soetomo General Academic Hospital, Surabaya.

Results

Of 60 victims, only 34 victims went through post-mortem examination. Out of 34 victims, only 11 went through external and internal post-mortem examination, while the rest (23 victims) only went through external examination (Table 1).

Table 1. Distribution of victims by type of post-mortem examination

Type of Post-Mortem Examination	2020	2021	Total
External post-mortem examination	22	1	23
External and internal post-mortem examination	9	2	11
Reports not found	9	17	26
Total	40	20	60

Source: Research data, processed

Out of 34 victims, age group of 21-30 and 31-40 years old had the greatest number of victims (26.47%) with 9 subjects each, then followed by age group of 41-50 years old (17.65%) with a total of 6 subjects. The sex of all age groups was dominated by male except for age group of 0-10 year(s) old with no male victims (Table 2).

Table 2. Distribution of victims by age range and sex

Age Range	Sex		Total
	Male	Female	
0-10 year(s) old	0	2	2
11-20 years old	4	0	4
21-30 years old	8	1	9
31-40 years old	7	2	9
41-50 years old	4	2	6
>50 years old	3	1	4
Total	26	8	34

Source: Research data, processed

Most common type of injury in all victims were abrasion, sharp force injury, contusion, and firearm injury. For sites of injury, most injuries were found in site 1 and site 2 (Table 3).

Table 3. Distribution of injury by type of injury and sites of injury

Type of Injury	Sites of Injury					Total
	1*	2*	3*	4*	5*	
Sharp force injury	28	22	4	29	19	102
Abrasion	38	24	2	28	17	109
Contusion	47	8	3	17	3	78
Laceration	19	0	0	2	0	21
Dislocation	0	0	0	4	0	4
Fracture	8	24	0	1	0	33
Burn injury	0	0	0	0	2	2
Firearm injury	2	69	1	2	0	74
Total	142	147	10	83	41	423

*Notes:
1 = Head and neck
2 = Chest and upper back
3 = Stomach and lower back
4 = Upper extremities
5 = Lower extremities

Source: Research data, processed

Fifteen victims were found with >10 injuries, then 9 victims were found with 6-10 injuries, and 10 victims were found with 1-5 injury(s) (Table 4).

Table 4. Distribution of victims by number of injuries

Number of Injuries	Frequency
1-5 injury(s)	10
6-10 injuries	9
>10 injuries	15
Total	34

Source: Research data, processed

Six out of 11 victims that went through internal examination had sharp force trauma as the cause of death, with exsanguination as the mechanism of death. Five victims had blunt force trauma as the cause of death, with 3 victims having asphyxia, 1 victim having exsanguination, and 1 victim having cranio-cerebral damage as their mechanism of death (Table 5).

Table 5. Distribution of victims by cause of death and mechanism of death

Mechanism of Death	Cause of Death		Total
	Blunt Force Trauma	Sharp Force Trauma	
Asphyxiation	3	0	3
Exsanguination	1	6	7
Cranio-cerebral damage	1	0	1
Total	5	6	11

Source: Research data, processed

Discussion

During the data collection, a total of 60 victims were found where 40 of them from the year 2020 and 20 of them from the year 2021. Then after collecting their examination reports, only 34 examination reports were found out of 60, 31 of them from the year 2020 and 3 of them from the year 2021. The data that were collected were from the copy of the forensic examination report, since the original copy can only be accessed at the police station following the protocol of unnatural death victims. The body was brought to the forensic examination room to be then examined by a forensic doctor. The doctor then wrote a report of the examination, and the original copy of the report had to be given to the police.[11] Forensic examinations for unnatural death victims were seen as unimportant by their families and sometimes chose to just accept the victim's death, whatever the cause may be.[12] On the other hand, forensic examination for unnatural death victims was of utmost importance for a police officer to then help their

investigation to catch the culprit.[13] During data collection, it was found that for some of the victims, their examination report was replaced with a letter stating that the family chose to forcedly bring home the body without going through any examination from the forensic doctor and would not sue if further problems should arise.

It was found that a bad archiving system could be one of the reasons for some of the examination reports could not be discovered. The archiving system at the Installation of Forensic Medicine and Medicolegal Dr. Soetomo General Academic Hospital, Surabaya, was still by gathering all the reports from the same year and collecting it into a thick book. Data collection for the year 2021 was performed in early 2022, therefore none of the reports from the year 2021 was yet to be archived neatly and some of the reports might still be scattered in many places. It might be the reason for the examination reports unable to be discovered.

In this study, the age group with the highest frequency was 21-30 years old (26.47%) and 31-40 years old (26.47%) followed by 41-50 years old (17.65%). A study by Syarifah (2018) obtained the results of the highest age frequency in the range of 36-45 years old (24.3%) followed by the 46-55 years old age group (15.7%).[5] A study by Wicaksono, *et al*. (2014) showed that the age group of 21-40 years old had the highest frequency (45%).[14] A study by Sumampouw, *et al*. (2016) also showed that adult age (26-45 years old) was the age with the highest frequency (38%).[15]

The aforementioned age groups were called the productive age groups where people tend to engage in a lot of activities and interaction with others. In big cities, these age groups mostly consist of immigrants from the suburbs who come to big cities. Hence, it does not rule out the possibility of social and economic inequalities that create a risk for crime, one of which is homicide.[5] The number of homicide victims in the young adult age group could be since, at that age, many are involved in activities such as street crime, involved in gangs, fighting, drug use, possession of weapons, and other activities that are at risk for homicide.[16] There are no globally accepted age classifications. Therefore, this classification was made for the sole purpose of statistically presenting the age variables per every decade. In this study, there were more male victims (76.47%) than women (23.53%). These results are consistent with a study conducted by Suwontopo, *et al*. (2022), Sakulsaengpraha, *et al*. (2018), Sumampouw, *et al*. (2016), and Wicaksono, *et al*. (2014).[6,14,15,17] Males were more prone to be homicide victims because males interacted and did activities outside the house more socio-economically, such as being workers, while women stayed in the house more.[5]

Suwontopo (2022), who conducted a study in Manado during the COVID-19 pandemic from March 2020 to February 2021, showed that 72% of the victims were male and 28% were female.[17] He explained that male victims were more prone to homicide victims, especially in Manado, because of the influence of local culture and criminal tendencies in certain areas. In Manado, males were more prone to get involved in criminal activities since males preferred to socialize in certain groups or communities, and sometimes clashes could happen between two groups or communities. Especially if alcohol was consumed, then it would increase the possibility of criminal action such as homicide.[17] Sakulsaengpraha (2018) conducted a study in Thailand on trends of homicidal death, and his result showed that male victims' percentages were higher (84.9% than that of female victims (15.1%).[6] He explained that the percentage of male victims had consistently always exceeded female victims all around the world. One of the factors that could influence the ratio was that it depended on the country's income level. Low- and middle-income countries tend to have a larger ratio of male-to-female victims.[6]

Sumampouw (2016) also conducted a study in Manado in 2016, which gave the result that 12% of the victims were female and 88% were male.[15] His reasoning was that males, even though culture has a big role, tend to socialize with the outside world more and tend to get involved in unsafe activities such as drinking activities and getting involved in gangs.[15] Wicaksono (2014), who conducted a study in Bali, showed that 72.5% of the victims were male and 27.5% of the rest were female.[14] He mentioned that his result was aligned with international characteristics of homicide victims which male victims dominated. His reasoning was that the characteristic of males in Bali was that they were involved more in organizations like gangsters who tend to overconsume alcohol which could lead to the loss of self-control and could get involved in criminal acts such as homicide.[14]

In this study, injuries were categorized by referring to the book "Handbook of Forensic Medicine" by Madea.[18] The most common types of injuries were abrasion (25.77%), followed by sharp injury (24.11%), and contusion (18.44%). The same result was obtained by Alim, *et al*. (2017), who conducted a study at the Department of Forensic and Medicolegal of Cipto Mangunkusumo National Center General Hospital, Jakarta.[19] Out of 3,015 traumas from a total of 153 victims, the 3 most common types of injuries were 40% abrasion, 24.84% sharp injury, and 21.03% contusion.[19] In this study, body sites of injury were divided into (1) head, neck, (2) chest, upper back, (3) abdomen, lower back, genitals, (4) upper limbs, and (5) lower movement members. The site with the highest frequency of injuries were site 2 (34.75%), followed by site 1 (33.57%), followed by site 4 (19.62%), followed by site 5 (9.70%), and lastly region 3 (2.36%).

In this study, site 1 had the second highest percentage, which was different from the study conducted by Alim, *et al*. (2017) where the head-neck site had the highest distribution of injuries.[19] In his study, the head-neck site was dominated by abrasion, while in this study site 1 was dominated by contusion. In this study, the type of injury in site 2 was dominated by firearm injury, while in his study, site 2 was dominated by open injury with straight edges. The distribution of the number of types of injury obtained by Alim, *et al*. and this study was different.[19] The perpetrator of violence will choose the part of the body that can be maximally affected with minimum effort.[20] In this study, one of the reason why there were many firearm injury in site 2

was because most of this was performed by police officer to apprehend criminal. Police officers were trained to shot at lethal area to quickly paralyze those that they are chasing such as in the chest or lower extremities. Not everyone has to be a doctor to know that site 1 (head-neck) and site 2 (chest-upper back) contain many important organs, and if injured could possibly be lethal, such as the heart, lungs, brain, and major blood vessels.

In this study, site 4 became a site dominated by sharp injury and abrasions. The same result was obtained in the study by Alim, *et al*. (2017) where the right and left arm site were areas dominated by sharp injury and abrasion.[19] According to Chattopadhyay, injuries to the upper limbs could be defensive wounds.[21] The victims could have gotten these injuries when they tried to reflect attacks from their attacker in order to avoid it from hitting vital area such as the chest, stomach, neck, and head. The number of injuries was divided into 3 with the classification of (1) 1-5 injury(s), (2) 6-10 injuries, and (3) >10 injuries. The highest frequency was found in subjects with classification (3), continued with a wound classification (1), and the least with classification (2). Classifications (1) and (2) were dominated by firearm injuries, although some subjects had other types of injuries such as abrasions and bruises. Meanwhile, classification (3) was mostly dominated by open wounds caused by sharp force injuries. Classification of the number of injuries >10 can be categorized as "overkill". According to Bell, overkill is injuring the victim excessively beyond the limit needed to kill the victim. There was no perimeter that could be said when a certain number of injuries on a person is considered an overkill. It would be easy to say that the number of injuries of a victim as an overkill phenomenon if the wounds were numerous, but it would be difficult to make a lower limit to say a certain number of injuries classified as an overkill phenomenon if there were only few injuries.[22,23]

The purpose of the perpetrator doing overkill could be to show dominance and power to the victim.[22] Overkill perpetrators could also have immature emotions. They commit crimes because they felt frustrated, depressed, and had held back anger for a long time which at one time exploded and directed the anger to the victim causing the victim to be inflicted with large number of wounds.[23] Out of 11 victims that went through external and internal post-mortem examination, the cause of death was mostly caused by sharp violence (54.54%) and blunt violence (45.45%). A study conducted by Suwontopo, *et al*. (2022) showed the same results where the most common cause of death was sharp force trauma (57%) followed by blunt force trauma (43%).[17] The study by Alim, *et al*. (2017) showed the same thing where the most common cause of death was sharp force trauma (60.87%) followed by blunt force trauma (36.52%).[19] However, different results were obtained by Solano, *et al*. (2017) and Wicaksono, *et al*. (2014) where the cause of death was mostly due to blunt force trauma.[14,24]

In this study, the most common mechanism of death was exsanguination (54.54%) followed by asphyxiation (27.27%), and the smallest percentage was cranio-cerebral damage (18.19%). The results of this study were the same as the results of Raj (2016) and Indrayana (2018), where the mechanism of death was mostly exsanguination followed by asphyxia.[20,25] However, the study by Syarifah (2018) showed different results where the most common mechanism of death was asphyxiation (52.64%).[5] The reason for the low number of victims also getting the internal examination was that many families still considered it taboo. As mentioned, the police sometimes felt that it was unnecessary. For unnatural death to be examined by forensic doctors, police must also bring the letter for examination request when bringing the body, sometimes the police feel like only external examination is necessary for a particular case, whether the victim's family could influence that decision is another matter, but forensic doctors can only examine based on what the police requested.

Strength and Limitations

The strength of this study was that this study provided data on the number of each type of injury per site of injury. This could help to study further the characteristics of the perpetrator, such as height. The limitation of this study was that it could only present the data in a limited time frame and could not make the interdisciplinary correlation with the data available.

Conclusion

Based on the results, it could be concluded that in this study, the sex of the victims was mostly male, age range was dominated by 21-30 and 31-40 years old, the most common type of injury was abrasion, the most frequent sites of injury were site 2 (chest and upper back), most victims suffer from ≥10 injuries, the most common cause of death was sharp force trauma, and the most common mechanism of death was exsanguination.

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Conflict of Interest
The authors declared there is no conflict of interest.

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Ethical Clearance
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Authors' Contributions

Designed the study, collected, and analyzed the data, and drafted the manuscript: IS. Supervised result and discussion: AY, TAS, NS.

References

1. Yudianto A. Autopsi: Bedah Mayat. In: *Ilmu Kedokteran Forensik*. Surabaya: Scopindo Media Pustaka, pp. 170–172. [Book]
2. International Criminal Court. Elements of Crimes. Netherlands, https://www.icc-cpi.int/sites/default/files/Publications/Elements-of-Crimes.pdf.
3. Statistics Indonesia (Badan Pusat Statistik). *Statistik Kriminal 2021*. Jakarta, https://www.bps.go.id/id/publication/2021/12/15/8d1bc84d2055e99feed39986/statistik-kriminal-2021.html (2021).
4. Statistics Indonesia (Badan Pusat Statistik). *Statistik Kriminal 2022*. Jakarta, https://www.bps.go.id/id/publication/2022/11/30/4022d3351bf3a05aa6198065/statistik-kriminal-2022.html (2022).
5. Syarifah MC. *Analisis Profil Autopsi Kasus Mati Tidak Wajar di Instalasi Kedokteran Forensik dan Medikolegal RSUD Dr. Soetomo Surabaya Periode Januari 2014 - Desember 2016*. Universitas Airlangga, https://repository.unair.ac.id/68897/ (2018).
6. Sakulsaengprapha V, Peonim V, Worasuwannarak W. Trends of Homicidal Deaths in Central Bangkok, Thailand: A 5-Year Retrospective Study. *Egypt J Forensic Sci* 2018; 8: 14. [Springer]
7. Subramanyam S, Janardhanan J. Correlation of Attributes of Homicide Cases with Its Severity based on Homicide Injury Scale. *Indian J Forensic Med Toxicol* 2019; 13: 10. [ResearchGate]
8. Triana A, Fauzi A. Dampak Pandemi Corona Virus Diserse 19 terhadap Meningkatnya Kriminalitas Pencurian Sepeda Motor di Surabaya. *Syiah Kuala Law J* 2020; 4: 302–309. [Journal]
9. Statistics Jawa Timur (Badan Pusat Statistik Provinsi Jawa Timur). *Statistik Politik dan Keamanan Provinsi Jawa Timur 2021*. Surabaya, https://jatim.bps.go.id/publication/2022/09/30/9bd1ea90412dc3853708a51b/statistik-politik-dan-keamanan-provinsi-jawa-timur-2021.html (2021).
10. Microsoft. Excel [Computer Program]. Version 2401 Build 16.0.17231.20236. Redmond: Microsoft Corporation; 2016.
11. Supreme Court of the Republic of Indonesia (Mahkamah Agung). Kitab Undang-Undang Hukum Acara Pindana (KUHAP). Undang-Undang Nomor 8 Tahun 1981, Indonesia, https://jdih.mahkamahagung.go.id/storage/uploads/produk_hukum/file/KUHAP.pdf (1981).
12. Praweningtyas E. Motivasi Penolakan Tindakan Pemeriksaan Forensik sebagai Akibat Peningkatan Angka Kejadian Pulang atas Permintaan Sendiri (APS) di Instalasi Kedokteran Forensik RSUD Dr. Saiful Anwar Malang Tahun 2013-2016. *J Forensik dan Med Indones* 2019; 1. [Journal]
13. Samsudi S, Ohoiwutun YAT, Suyudi GA, *et al*. Urgensi Autopsi Forensik dan Implikasinya dalam Tindak Pidana Pembunuhan. *Verit Justitia* 2021; 7: 325–348. [Journal]
14. Wicaksono RDA, Yulianti K. Karakteristik Sebab dan Mekanisme Kematian pada Korban yang Diduga Dibunuh yang Diotopsi di Instalasi Kedokteran Forensik RSUP Sanglah Tahun 2011-2012. *E-Jurnal Med Udayana* 2014; 3: 561-572. [Journal]
15. Sumampouw BT, Siwu JF, Mallo JF. Kasus Kematian yang Diakibatkan oleh Pembunuhan yang Masuk Bagian Forensik RSUP Prof Dr. R. D Kandou Manado Tahun 2015. *JKK (Jurnal Kedokt Klin* 2017; 1: 29–36. {Journal]
16. Purwoko FS. *Karakteristik Demografi Korban Pembunuhan yang Diperiksa di Departemen Forensik dan Medikolegal RS Bhayangkara TK II Medan*. Universitas Muhammadiyah Sumatera Utara, http://repository.umsu.ac.id/handle/123456789/18380 (2022).
17. Suwontopo JT, Mallo NTS, Kristanto EG. Homicide Cases During COVID-19 Pandemic at Prof. Dr. R. D. Kandou Hospital, Manado, in the Period between March 2020 and February 2021. *Med Scope J* 2022; 3: 143–150. [Journal]
18. Madea B. *Handbook of Forensic Medicine*. Wiley, https://books.google.co.id/books?id=B44fAwAAQBAJ (2014).
19. Alim DP, Budiningsih Y. Karakteristik Demografi Kasus Pembunuhan yang Diperiksa di Departemen Forensik dan Medikolegal RSUPN Cipto Mangunkusumo Tahun 2014-2016. 2017.
20. Indrayana MT, Afandi D, Hasanah U, *et al*. Autopsy Profile of Homicide and Suicide Cases in Riau Province 2010-2014. In: *Konferensi Nasional Perhimpunan Dokter Forensik Indonesia*. Perhimpunan Dokter Forensik Indonesia, 2016. [ResearchGate]
21. Chattopadhyay S, Sukul B. Pattern of Defence Injuries among Homicidal Victims. *Egypt J Forensic Sci* 2013; 3: 81–84. [ScienceDirect]
22. Karakasi MV, Nastoulis E, Zisopoulos K, *et al*. Investigating the Phenomenon of Overkill in Greece: A Forensic Psychiatric Autopsy Study between 2005 and 2020. *J Forensic Leg Med* 2021; 81: 102184. [ScienceDirect]
23. Solarino B, Punzi G, Di Vella G, *et al*. A Multidisciplinary Approach in Overkill: Analysis of 13 Cases and Review of the Literature. *Forensic Sci Int* 2019; 298: 402–407. [PubMed]
24. Solano EE, Mayedo YO, Seyoumk M. A One-Year Retrospective Study on the Pattern of Death Found at Autopsy at Forensic Pathology Department, Menelik II Hospital in Addis Ababa, Ethiopia. *East Cent African J Surg* 2017; 22: 98. [Journal]
25. Raj D, Kumar V, Venkatesha V, *et al*. Pattern of Injuries in Homicidal Victims in South Bangalore. *J Indian Acad Forensic Med* 2018; 40: 392. [ResearchGate]