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Original Research Article

Injury Profiles and Pain Perception in a Mass Pilgrimage Gathering: An Observational Study from Mahakumbh 2025

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Abstract

Introduction: At mass gatherings, the dense congregation of individuals presents notable public health challenges, particularly concerning injury occurrences and the pain management of the pilgrims. **Material & Methods:** Objective of the study is to study the injury characteristics in pilgrims, and to follow pattern of injury incidence during pilgrimage, during Maha Kumbh a mass gathering. It is prospective study where pilgrims were followed for a complete duration of Maha Kumbh 2025. **Results:** Thousands of injuries occurred during the Maha Kumbh Mela 2025, Uttar Pradesh, out of which 250 have been reported at AIIMS Emergency Medical camp. 59 out of the 250 (23.6%) were included to our study as per our inclusion and exclusion criteria. The most common occurred injury type was Laceration, representing 71.18% of all injury. The mean pain severity was 6.32 while the low and high pain severity was 0 and 10 respectively. The most frequent pain type produced by the injury wounds was sharp pain, 54.24% while throbbing was the least representing 1.69%. **Conclusion:** There is the need of robust triage systems, injury surveillance, and first-aid preparedness to mitigate health risks and strengthen public health response during large-scale religious gatherings.

1. Introduction

Forensic "Gathering of more than a specified number of persons at definite location for a specific purpose for a defined period of time" is defined as mass gathering by the World Health Organization (WHO). The Maha Kumbh Mela is recognized as one of the largest mass gatherings globally, attracting millions of pilgrims to the confluence of the Ganges and Yamuna rivers in India, and expose to a range of health risk.¹⁻³ The

large number of peoples attending a mass gathering makes planning and management of the event a substantial task. It is a mass Hindu pilgrimage of faith in which Hindus from all over the world gather to have a dip in a sacred river.⁴ While the event holds profound spiritual significance, the dense congregation of individuals presents notable public health challenges, particularly concerning injury occurrences⁵ and the

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management of associated pain. By walking bare foot to the river that involves a considerable injury-risk. The prevention of injuries together with catastrophic stampedes and drowning and fires requires controlling crowd numbers to safe levels. The Maha Kumbh Mela ranks as one of the biggest human gatherings worldwide yet researchers have paid minimal attention to its injury risk assessment. Several research studies have investigated injury risks in professional football matches in Germany and France⁶⁻¹² but no specific studies exist for the Maha Kumbh.

Research on mass gatherings has revealed different types of injuries which occur during such events. The analysis of event attendees shows that soft-tissue traumas and multi-trauma incidents along with lower limb injuries and head traumas occur most frequently. Marathon event analyses show different injury patterns and medical usage rates which demonstrate the requirement for detailed medical planning in large-scale events.¹³ The massive scale of the Maha Kumbh Mela creates distinctive obstacles for both injury tracking and healthcare response. The literature emphasizes the necessity of organized injury surveillance and healthcare readiness for events that bring large crowds together. The Maha Kumbh Mela lacks specific research that investigates both injury patterns and the self-reported pain experiences of its pilgrims.

In the Indian context, Studies of injury patterns from different regions provide important information on the kinds of trauma experienced in diverse high-risk settings. The majority of two-wheeler accident victims had head and lower limb injuries, according to a research conducted in Agra by Gupta et al. and Talukhdar et al (2023).^{14,15} This study also showed how external variables like traffic congestion, protective gear, and surface quality greatly affect the severity of injuries. In our study, pilgrims walking barefoot on uneven terrain during the Maha Kumbh showed identical damage patterns, especially affecting the lower limbs, despite the different method.

This comparison highlights how exposure to the environment and a lack of protective gear shape injury profiles in both huge religious gatherings and highway accidents. Our research targets the evaluation of reported injuries at outreach medical camps during the Maha Kumbh 2025. Our research combines image-based evaluations with validated questionnaire-based pain assessments to deliver a

complete picture of health consequences from this mass gathering. The obtained insights will help develop better public health strategies and improve injury prevention measures and large-scale religious event management protocols.

2. Materials & Methods

This study was designed as a cross sectional and observational analysis carried out during the Maha Kumbh Mela 2025 in Prayagraj, India. The data was gathered from the pilgrims who visited the outreach health camps of AIIMS Raebareli in collaboration with the district sub central hospital Kanpur at Sector 20, Akhada wapasi marg, Jhusi, Prayagraj to provide first aid and primary care to attendees.

a. Participants and Sampling

All individuals who were able to give consent and had either a new injury complaint or visible trauma were included in the study. The exclusion criteria included chronic pain conditions, cognitive impairments, or unwillingness to give consent for image capture. Purposive sampling method was adopted to ensure representation of different types of injuries. A total of 1500 injured patients have been reported at the AIIMS Raebareli medical health camp, 59 patients (49 Males and 10 Females) have been included as per our study protocols. The final sample size was chosen based on the number of patients who were eligible to be included in the study and who attended the camps during the peak days of the mela.

b. Data Collection Tools

A standard data collection form served to gather information about participants. The survey instrument consisted of several sections which gathered information about participants' demographics (age and gender and place of origin), their injury type and cause (such as falls or stampedes or fatigue-related incidents), affected body areas and received medical treatment. A standard Numeric Rating Scale (0–10) measured subjective pain while the results were grouped into three pain severity categories.

c. Image-Based Analysis

Standardized photography guidelines were used to document injuries through the capture of bruise and contusion images. The analysis of images for color characteristics helped determine the probable age of the injury through color development stages (red/purple for acute and green/yellow for healing). The non-invasive image-based analysis technique supported medical examinations by validating the information from patient histories.

Table 1: Percentage Breakdown and Proportion Analysis of Injury Causes.

Cause of Injury	Occurance (in %)	P	95% CI	
			LL	UL
Walking barefoot	23.73%	0.2373	0.1465	0.361
Falls	22.03%	0.2203	0.1329	0.343
Pressing (Overcrowding)	10.17%	0.1017	0.0448	0.209
Burn by hot water/fire/other	10.17%	0.1017	0.0448	0.209
Road Traffic Accident	10.17%	0.1017	0.0448	0.209
Mirror/Knife/Scissor	6.78%	0.0678	0.0228	0.168
Bitten by Dog/Human	5.08%	0.0508	0.0126	0.146
Stoning	5.08%	0.0508	0.0126	0.146
Fight	1.69%	0.0169	0.0000	0.100
Other	6.78%	0.0678	0.0228	0.168

Table 2: Effect Size and Heterogeneity of Injury Causes.

Measure	Level	Estimate	95% CI	
			LL	UL
H ²	Overall	1.64055	1.1325	3.4208
I ² (%)		2.55881	1.2443	11.3387
T		60.91930	19.6323	91.1807
T ²		0.04779	0.0189	0.1231
		0.00228	0.000358	0.0151

Table 3: Percentage Breakdown and Proportion Analysis Distribution of Injury Pattern.

Pattern of Injury	Occurance (in %)	P	95% CI	
			LL	UL
Laceration	71.18%	0.7119	0.5851	0.812
Incised Wound	13.56%	0.1356	0.0685	0.249
Burn	10.17%	0.1057	0.0448	0.209
Abrasion (Graze)	5.08%	0.0508	0.0126	0.146

LL: Lower Limb, UL: Upper Limb.

Table 4. Effect Size and Heterogeneity of Injury Pattern.

Measure	Level	Estimate	95% CI	
			LL	UL
H ²	Overall	6.0148	4.0644	27.10
I ² (%)		34.4212	15.6715	700.42
T		97.0948	93.6190	99.86
T ²		0.2523	0.1672	1.15
		0.0636	0.0279	1.33

d. Ethical Considerations

The Institutional Ethics Committee of AIIMS Raebareli granted ethical approval for this study (Study/Protocol number: 2024-12-OTH-EXP-9). The researchers explained the research goals to participants while guaranteeing their information would remain confidential. All participants received written consent before they joined the study and before their images were recorded. The photographic data did not contain any identifiable personal information.

e. Data Analysis

The data entry process used Microsoft Excel for data cleaning before SPSS version 26 and Python conducted the analysis. The analysis included

descriptive statistics to present demographic information along with injury types and pain scores. The research used Chi-square tests together with correlation analysis and regression modeling to study the relationships between injury characteristics and subjective pain experiences. The statistical significance threshold was set at $p < 0.05$.

3. Result

The study involved 59 participants whose mean age was 43 ± 17 with ages ranging from 8 to 80 years. Among them, 83.05% were male and 16.95% female. Breakdown injury cause can be seen in the **Table 1**. The majority of the injuries occurred due to walking (barefoot) (23.73%) (95% CI: 0.1456-0.361), followed by falls (22.03%) (95% CI: 0.1329-0.343), and road traffic accident (10.17%) (95% CI: 0.0448-0.209). **Table 2** presents the proportion of each injury cause, along with 95% confidence intervals. Heterogeneity statistics (Diamond Ratio, H², I², τ , and τ^2) indicate moderate to substantial variability in the proportions across injury causes, with an I² of 60.92%, suggesting considerable inconsistency not attributable to random chance.

Injury Pattern Distribution

As per the result shown in **Table 3**, lacerations represented the most frequent injuries (71.18%) (95% CI: 0.5851-0.812), while abrasion remained relatively low (5.08%) (95% CI: 0.0126-0.146). Heterogeneity measures shown in **Table 4**. Indicate extremely high variability in injury pattern proportions, with an I² value of 97.09%, suggesting that the observed variation is not due to sampling error alone. The large Diamond Ratio and H² values further support substantial heterogeneity among injury types. The lower limbs (foot, ankle, and calf) were the most commonly affected areas (55.93%), followed by upper limbs and the back.

Image-Based Color Analysis

Out of the total cases of visible injury ($n = 59$), the majority showed red to purple shades, suggesting acute-phase injuries (<24 hours). A smaller proportion demonstrated purple to yellow hues, indicative of subacute injury (48 hours - 3 days old). Acute-phase injuries had a statistically significant relationship with self-reported pain severity as the acute-phase injuries yielded higher pain scores ($p < 0.05$).

Pain Assessment

The mean pain score was 6.32, with 25.42% of participants reporting mild pain (0-3), 27.12% moderate pain (4-6), and 47.46% severe pain (7-10).

Sharp pain was the most common, with 52.24% cases, followed by dull pain with 32.20% instances. Burning pain was reported in 6.78% cases, while Tingling pain occurred in 3.4% cases, and Throbbing pain was the least reported, with just 1.69% case. Sharp and dull pain were the most frequently reported pain types and the three other pain sensations, burning, tingling, and throbbing, were infrequent. The analysis showed that there was a significant relationship between the type of injury and the level of pain ($p < 0.01$). The participants who had suspected fractures and muscle tears had higher pain scores compared to those with superficial injuries (ANOVA, $p < 0.05$).

Medical Intervention and Outcomes

Only first aid was required by 59 participants but 10 participants were sent to tertiary care centers for further evaluation. The results of logistic regression analysis showed that injury severity, pain score > 6 and swelling were predictors of referral ($p < 0.05$).

Gender and Injury Correlation

A chi-square test of independence was conducted to examine the association between gender and level or type of injury, and the result of the test has been shown in [table 5](#). The results showed no significant difference in the level of injury between male and female subjects, (χ^2 (3, N=59) = 2.17, $p=0.538$), yet females reported higher pain scores on the scale of 10, an average of 9.5.

Standardize residuals for each cell were examined to assess contributions to the overall chi-square statistics. All standardized residuals were within the range of ± 1.17 , indicating that no cell significantly deviated from expected frequencies. Thus, no post hoc analysis was required.

Table 5: Frequency distribution and Chi-square Test of Independence between Gender and Type of Injury.

Gender	Type of Injury				Total
	Laceration	Abrasion (Graze)	Burn	Incised Wound	
Male	35	2	6	6	49
Female	7	1	0	2	10
Total	42	3	6	8	59
			Value	df	p
χ^2			2.17	3	0.538
χ^2 continuity correction			2.17	3	0.538
N			59		

4. Discussion

Mass gatherings such as the Maha Kumbh Mela pose significant public health challenges due to the massive influx of people, environmental exposures, and logistical complexities. The main objective of this study was to determine the nature of injuries and

self-reported pain experienced by pilgrims during the Maha Kumbh 2025 which was complemented by image analysis of bruise appearance. The results provide information that can be helpful for designing measures for the prevention of injuries and their treatment in such crowded areas and highlight the need for careful planning for medical response in such events.

The most common cause of injury was walking barefoot (23.73%), followed closely by falls (22.03%), which is in line with previous studies that have been conducted at mass gatherings such as the Royal Agricultural Show (RAS)⁵ and the Arbaeenia pilgrimage, where falls, fatigue, and surface irregularities were noted as some of the major causes of injury burden. Factors that may have contributed to the high rate of lower limb injuries in our study included environmental factors such as rough surface, high population density and long walking distance. One of the avulsed lacerated wounds is depicted in [fig. 1](#).

Fig. 1: Avulsed lacerated wound of size 3cm x 2cm x bone deep exposing underlying soft tissue, ligament and bone, with fresh blood – over distal 3rd of right 2nd toe.



The most common injuries observed was laceration (71.18%), in line with the findings of Bissell et al. and others who also reported similar types of injuries in large gatherings. Less frequent injuries abrasion, and burn, had specific localized causes, which could have been related to close contact with animals or hot objects in the temporary tents or kitchens. The high incidence of lower limb injuries points to the physical exertion that is associated with walking for a long time, lack of protective shoes, and crowd incidents.

In this study, the use of image-based color analysis gave an innovative and objective way of determining the age of injuries. The majority of injuries presented red to purple discoloration which indicates recent trauma occurred less than 24 hours ago. The study confirms other research which

demonstrates that visual assessment tools improve both injury staging precision and management effectiveness. The statistical significance between injury color and pain intensity supports the use of this method as a practical clinical tool.

The pain assessment showed that 47.46% of participants experienced severe pain while sharp and dull pain emerged as the most prevalent types of pain. The pain patterns observed in our study matched the patterns described by Wideman et al.¹⁶ in multimodal pain assessment models and demonstrated the diverse and complex nature of pain in acute trauma conditions. The results demonstrated strong correlations between pain types and their severities and the nature of injuries especially deep tissue damage and suspected fractures produced the highest pain scores. The findings indicate that pain evaluation needs structured assessment methods when treating numerous patients in low-resource health camps during mass gatherings. One of the fluid filled blister caused due to burn is depicted in [fig. 2](#).

Fig. 2: Fluid filled blister of size 19cm x 8cm present over left ankle and foot.



The referral of 10 cases to tertiary care was based on pain scores above 6 and swelling as the primary indicators for referral. This shows the importance of early triage systems that consider symptom severity and clinical features to make decisions on referrals and to avoid congesting emergency facilities. The results that showed that the mean pain scores were slightly higher for the female participants, although not statistically significant in terms of injury severity, are consistent with previous findings that females are more sensitive to pain or report higher levels of pain or discomfort. In agreement with the retrospective analysis by Chitbeer et al.¹⁷, our study also highlights the importance of the onsite medical providers in the process of injury documentation and management. The types of injuries documented here include soft tissue injury, blunt force trauma, and superficial

injuries which are consistent with the range of potential hazards in crowded, multi activity areas. Furthermore, the use of visual analytics in combination with self-reporting tools provided a more detailed picture of the consequences and acuteness of the injuries that pilgrims suffered.

The Maha Kumbh Mela stands apart from other large events because its religious ceremonies create distinct injury patterns. The spiritual practice of barefoot walking exists as a fundamental tradition for pilgrims because it represents their devotion and humility. The practice of walking barefoot on dangerous terrain with debris leads to elevated risks of foot injuries. Our study shows that the practice of walking barefoot resulted in numerous lower limb injuries and lacerations which directly caused these types of injuries. The mass bathing rituals at riverfront steps create special risks for participants. The combination of water accumulation and soap residue and excessive use at these areas makes them dangerous because they become slippery which results in more frequent falls and related injuries including contusions and abrasions. Additionally, the episodic surges in crowd density, especially during the lucky bathing seasons, produce high-pressure situations that are vulnerable to psychological distress, blunt injuries, and trampling. Given their cultural significance, these variables need the implementation of certain public health measures designed for these situations, such as installing protected walkways, anti-slip flooring next to ghats, and well-placed railings.

In this study, we have added new data on fresh injury epidemiology at the Maha Kumbh Mela and developed a mixed-methods approach which incorporates image-based assessment and pain measurement. These findings offer specific guidance for developing future policies and emergency readiness plans at Kumbh Mela events and comparable religious events. The observed injury patterns together with their risk factors enable the development of the following policy recommendations.

- 1. Foot Protection Initiatives:** The establishment of affordable protective footwear stalls near entry points combined with spiritual practice-friendly educational programs would help decrease lower body injuries. The installation of 'barefoot-safe' zones with soft rubber mats or treated walkways throughout the area would help reduce the number of accidents.

2. **Ghats Safety Enhancements:** The installation of non-slip flooring and effective drainage systems at bathing ghats will help decrease the number of people who slip and fall. The combination of real-time foot traffic monitoring with timed entry pass systems for timed entry will help prevent excessive crowd density during peak religious ceremonies.
3. **Crowd Surge Management:** The implementation of crowd control systems with AI-based surveillance and real-time density monitoring will help prevent stampede incidents by optimizing barrier placement. Security and medical teams need to practice emergency exit and safe zone identification with clear markings for effective response.
4. **Onsite Medical Triage Protocols:** The development of rapid triage teams should include training for image-based diagnostic tools and pain assessment scales. The study showed that these diagnostic tools help medical staff identify between minor and severe injuries which leads to better resource management and reduced unnecessary hospital transfers.
5. **Culturally Adapted Health Communication:** The delivery of safety instructions should use faith leaders and local dialects and visual infographics to reach the community effectively. The implementation of culturally appropriate safety messages will help people from the community follow safety protocols.
6. **Set appropriate medicolegal protocols:** Such mass gatherings are the potential areas where mass emergencies may occur. Appropriate medicolegal measures and prompt services from forensic experts may be needed considering the management of such disastrous situations.¹⁸⁻²⁰

These targeted initiatives, which are influenced by both cultural customs and environmental realities, can greatly improve emergency response and injury prevention at the Kumbh Mela. In order to safeguard public health during major religious gatherings, the study emphasizes the value of context-aware planning that combines contemporary safety science with customary practices.

Limitation

The study delivers significant information about pilgrim injuries and pain perception at Maha Kumbh 2025 yet researchers need to recognize multiple study restrictions. The researcher's availability at the outreach camp restricted

enrolment to only a limited number of participants. The researcher missed numerous injury cases because they had to handle multiple patients simultaneously during busy periods. The large size of the Maha Kumbh along with its multiple first aid posts and mobile foot patrols created conditions where numerous injured people received care elsewhere or avoided medical facilities altogether. The actual number of injuries might have been higher because people with minor injuries sought care at different facilities or did not seek medical help at all. People with non-visible or less severe injuries chose not to visit the health camp which resulted in selection bias. The study reveals important trends but the actual number of injuries that occurred during the event might exceed the reported figures because of these study restrictions.

The outreach camp where data were collected was located in close proximity to a major bathing ghat that was a high-density area with significant foot traffic and ritual activity. As a result, the camp population was skewed toward adult males and barefoot pilgrims engaging in ritual bathing practices. This demographic and behavioural concentration may have introduced selection bias, potentially overrepresenting lower limb injuries, lacerations, and falls due to wet or uneven surfaces. Other injury types or demographics (e.g., females, children, or elderly individuals not participating in bathing rituals) may have been underrepresented.

Importantly, as the study was restricted to a single medical site, the findings may not reflect the full range or distribution of injuries occurring across the entire Kumbh Mela, which spans multiple sectors, terrains, and population subgroups. Therefore, the generalizability of the results is limited.

5. Conclusion

The study highlights the healthcare challenges posed by mass gatherings like the Maha Kumbh Mela, where pilgrims face increased risks of injury from overcrowding, environmental strain, and prolonged exertion. Our findings reveal that lower limb and soft-tissue injuries emerged as the most prevalent, primarily caused by falls and extended walking. The integration of image-based color assessment with subjective pain evaluation proved effective in determining injury severity and estimating their age, enhancing clinical and forensic decision-making. These findings highlight the need for robust triage systems, injury surveillance, and first-aid preparedness to mitigate health risks and

strengthen public health response during large-scale religious gatherings.

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References:

- Sanders AB, Criss E, Steckl P, Meislin HW, Raife J, Allen D. An analysis of medical care at mass gatherings. *Ann Emerg Med.* 1986; 15(5):515-9.
- Friedman LJ, Rodi SW, Krueger MA, Votey SR. Medical care at the California AIDS Ride 3: experiences in event medicine. *Ann Emerg Med.* 1998; 31(2):219-23.
- World Health Organization. International Health Regulations (IHR) and mass gatherings [Internet]. Geneva: WHO; [cited 2025 May 20]. Available from: http://www.who.int/ihr/ith_and_mass_gatherings/en/
- Baranwal A, Anand A, Singh R, Deka M, Paul A, Borgohain S, et al. Managing the Earth's Biggest Mass Gathering Event and WASH Conditions: Maha Kumbh Mela (India). *PLoS Curr* [Internet]. 2015. doi: 10.1371/currents.dis.e8b3053f40e774e7e3fdb50a130d
- Zeitz KM, Zeitz CJ, Kadow-Griffin C. Injury Occurrences at a Mass Gathering Event. *Australas J Paramed.* 2005; 3:1–10.
- Fünten KAD, Faude O, Lensch J, Meyer T. Injury characteristics in the German professional male soccer leagues after a shortened winter break. *J Athl Train.* 2014; 49(6):786-93.
- Faude O, Meyer T, Federspiel B, & Kindermann W. (2009). Injuries in elite German football-A media-based analysis. *Deutsche Zeitschrift für Sportmedizin.* 2009; 60(6), 139-44.
- Bjørneboe J, Bahr R, Andersen TE. Gradual increase in the risk of match injury in Norwegian male professional football: a 6-year prospective study. *Scand J Med Sci Sports.* 2014; 24(1):189-96.
- Bjørneboe J, Flørenes TW, Bahr R, Andersen TE. Injury surveillance in male professional football; is medical staff reporting complete and accurate? *Scand J Med Sci Sports.* 2011; 21(5):713-20.
- Dauty M, Collon S. Incidence of injuries in French professional soccer players. *Int J Sports Med.* 2011; 32(12):965-9.
- Häggglund M, Waldén M, Ekstrand J. Injury incidence and distribution in elite football--a prospective study of the Danish and the Swedish top divisions. *Scand J Med Sci Sports.* 2005; 15(1):21-8.
- Häggglund M, Waldén M, Ekstrand J. Injuries among male and female elite football players. *Scand J Med Sci Sports.* 2009; 19(6):819-27.
- Nguyen RB, Milsten AM, Cushman JT. Injury Patterns and Levels of Care at a Marathon. *Prehosp Disaster Med.* 2008; 23(6):519-25.
- Gupta A, Singh G, Gupta P, Kumar A, Verma A. Pattern of Fatal Injuries Sustained by Two-Wheeler Riders Due to Road Traffic Mishap in Agra Region. *J Forensic Med Sci Law.* 2023; 32(1):25–31.
- Talukdar R, Ropmay AD, Slong D, Patowary AJ. A Retrospective Study of Road Traffic Accident Cases Brought For Medico-Legal Autopsy at a Tertiary Care Hospital In Meghalaya. *J Forensic Med Sci Law.* 2023; 32(1):37-40.
- Wideman TH, Edwards RR, Walton DM, Martel MO, Hudon A, Seminowicz DA. The Multimodal Assessment Model of Pain: A Novel Framework for Further Integrating the Subjective Pain Experience within Research and Practice. *Clin J Pain.* 2019; 35(3):212-21.
- Chitheer A, Lami F, Radhi A, Arbaji A. Injuries Reported by Selected Health Facilities During the Arbaeenia Mass Gathering at Babel Governorate, Iraq, 2014: Retrospective Records Analysis. *JMIR Public Health Surveill.* 2020; 6(2):e10877.
- Deokar RB, Patil SS. Avenues in Forensic Medicine. *J Forensic Med Sci Law* 2023;32(2):1-3.
- Deokar RB, Patil SS. Artificial Intelligence in Healthcare and Biomedical Research - Ethical aspects. *J Forensic Med Sci Law.* 2024;33(1):1-4. doi: 10.59988/jfmsl.vol.33issue1.1.
- Amrita A, Deokar RB. Clinical Forensic Psychology: It's Emergence, Significance and Application in India. *J Forensic Med Sci Law* 2022;31(2):80-83.