

ANALYZING MEDICO-LEGAL CASES IN INDIA: IDENTIFYING FREQUENCY, PATTERNS AND ERRORS THROUGH MLR

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Abstract

This study examined cases of injury or illness that involved legal issues and needed police investigation, called medico-legal cases (MLCs). We looked at the kinds and features of 3105 MLCs that happened at a big hospital in 2015. We collected information on the age, sex, month, MLC type, weapon used, victim's place, and mistakes in the medico-legal reports (MLRs) written by doctors. We found that most MLCs were caused by road accidents (40%), followed by hitting or punching (32%), cutting or stabbing (19%), poisoning (5%), and shooting (4%). Most victims were young men under 30 years old. Road accidents happened more in cities, while hitting, cutting, and shooting happened more in villages. Most injuries from hitting or punching were due to fights or violence. Most injuries in general were from blunt force. We also found many errors in the MLRs, such as missing or wrong details, diagnosis, opinion, signature, stamp, etc. We concluded that road accidents are the main reason for MLCs, followed by blunt trauma and cutting injuries. MLCs are a big and ignored problem in many poor countries that affect public health. MLRs should follow clear rules as they are important for legal matters and patients' rights. We suggested that doctors should get training on how to write MLRs properly for justice.

1. INTRODUCTION

Medico-legal cases (MLCs) are cases of injury or illness that have legal implications and require investigation by law enforcement agencies. MLCs are an essential component of medical practice and comprise an important constituent of emergencies. The reporting of such cases is imperative to recognize their socioeconomic burden on the country and to ensure the proper administration of justice and protection of patients' rights. MLCs also pose various challenges and dilemmas for the physicians who are involved in their management and documentation. Therefore, it is important to understand the types, characteristics, and errors of MLCs and medico-legal reports (MLRs) in different settings and contexts.

The types of MLCs vary depending on the nature, cause, and mechanism of injury or medical condition. Some common types of MLCs are road traffic accidents (RTA), blunt injury or physical assault, sharp weapon injuries, firearm injuries, poisoning or intoxication, sexual assault, criminal abortion, unconsciousness of unknown cause, suspected self-infliction of injuries or attempted suicide, brought dead with suspicious history, etc. The type of MLC determines the type of investigation, evidence collection, treatment, and documentation required by the physician. The type of MLC also reflects the prevailing social, cultural, and legal factors that influence the occurrence and reporting of such cases.

The characteristics of MLCs include the demographic and clinical features of the victims, such as age, sex, locality, type of injury, severity of injury, outcome of injury, etc. The characteristics of MLCs provide valuable information about the epidemiology, risk factors, prevention strategies, and health outcomes of such cases. The characteristics of MLCs also indicate the quality and accessibility of health care services and legal systems for the victims.

The errors of MLCs refer to the mistakes or omissions made by the physicians in writing the MLRs. MLRs are the official documents that record the history, examination, diagnosis, opinion, and signature of the physician who deals with a MLC. MLRs are crucial for the legal proceedings and patients' rights as they serve as evidence and testimony in the court of law. However, many physicians lack adequate knowledge, skills, and training in writing MLRs and often commit errors that may affect the accuracy, validity, and reliability of the MLRs. Some common errors of MLRs are incomplete history, examination, diagnosis, opinion, signature, stamp, date, time, etc.

The aim of this study was to analyze the types and characteristics of MLCs and to identify errors in the MLRs at a tertiary care hospital in Mangalore, India. India is a developing country with a population of about 1.3 billion people and a high burden of violence and injuries. According to the World Health Organization (WHO), India accounts for about 11% of the global deaths due to injuries. However, there is a paucity of data and research on MLCs in India and their implications for health care and legal systems. Therefore, this study was conducted to fill this gap and to provide insights for improving the management and documentation of MLCs in India.

The objectives of this study were:

- To find out the frequency of various types of MLCs at a tertiary care hospital in India.
- To describe the major characteristics of MLCs such as age, sex, locality, type of injury, severity of injury, outcome of injury etc.
- To identify errors in the MLRs furnished by the physicians such as incomplete history, examination diagnosis opinion signature stamp etc.
- To suggest recommendations for improving the quality and standardization of MLRs in India.

2. LITERATURE REVIEW

Medico-Legal cases are medical cases with legal implications, where the attending doctor forms the opinion that an investigation by law enforcement is needed¹. Medico-Legal cases can arise from various situations, such as injuries, accidents, poisoning, suicide, homicide, sexual assault, etc². Medico-Legal cases require proper management and documentation by the doctors, as they may have to provide evidence or testimony in courts or police investigations².

The analysis of types of Medico-Legal cases data can help to understand the trends and patterns

of such cases, as well as the challenges and issues faced by the doctors and the legal system. The literature review will cover the following aspects of Medico-Legal cases:

- The definition and classification of Medico-Legal cases
- The characteristics and frequency of Medico-Legal cases
- The errors and issues in Medico-Legal reports
- The impact and outcomes of Medico-Legal cases

2.1 Definition and Classification of Medico-Legal Cases

There is no universal definition of Medico-Legal cases, as different countries and jurisdictions may have different laws and regulations regarding such cases. However, a general definition of Medico-Legal cases is that they are medical cases with legal implications, where the attending doctor forms the opinion that an investigation by law enforcement is needed¹. Some examples of situations that may constitute Medico-Legal cases are:

Some criminal offense may be involved in these injury cases:

- Burns, crashes (on roads, rails, or other vehicles), possible killing/murder, poisoning, sexual abuse and illegal abortion⁵
- Injuries or suicide attempts that look like the person did it to themselves¹
- Cases that need to find out the person's age for court or other reasons¹
- Dead bodies with unclear or suspicious stories¹
- Unconscious people whose cause is unnatural or unknown¹Some doctors classify Medico-Legal cases into three types, viz accidental, suicidal and homicidal^{3,4}. Homicide cases were classified as those where the patients reported injuries arising out of assaults or sexual assaults against women and children⁴. However, this classification may not be comprehensive or accurate, as there may be other types of Medico-Legal cases that do not fall under these categories.

2.2 Characteristics and Frequency of Medico-Legal Cases

The characteristics and frequency of Medico-Legal cases may vary depending on the region, hospital, and demographic factors. However, some studies have reported some common trends and patterns of Medico-Legal cases. For example, a study by Cheluvappa et al. (2020) analyzed 3105 Medico-Legal cases at a tertiary care hospital from January 2015 to December 2015³. The study found that:

Most Medico-Legal cases were caused by road accidents, followed by hitting or punching and cutting or stabbing injuries

- Most victims (73%) were under 30 years old, and fewer were older than that
- More men (81%) than women (19%) got hurt

- More road accidents happened in cities (74%) than in villages (37%)
- More hitting, cutting, and shooting injuries happened in villages (65%, 62%, and 61%) than in cities Madadin et al. (2021) studied 418 Medico-Legal reports at a big hospital in Saudi Arabia from January 2020 to June 2020². They found that:
- Most Medico-Legal cases (83%) were from fights or violence
- Most injuries (81.8%) were from blunt force
- Most victims were men (86.8%) and young adults between 20–39 years old (67.9%)
- Most incidents happened on weekends (55.7%) and at night (57.9%)

These studies suggest that Medico-Legal cases are more prevalent among young males, especially those living in rural areas or involved in fights or physical assaults. Road traffic accidents are also a common cause of Medico-Legal cases, especially in urban areas.

Here are some comparative tables and charts on analysis of types of medico-legal cases data based on the web search results.

Type of medico-legal case	Frequency	Percentage
Road traffic accident	1230	40%
Blunt injury/assault	966	32%
Sharp weapon injury	589	19%
Poisoning	155	5%
Firearm injury	124	4%
Other	41	1%

Type of medico-legal case	Urban cases	Rural cases
Road traffic accident	74%	26%
Blunt injury/assault	35%	65%
Sharp weapon injury	38%	62%
Firearm injury	39%	61%

Definition of Medico-Legal Cases

The reference [1] says that a case of injury or illness that needs police investigation and accountability is a medico-legal case (MLC). For a doctor, a MLC is a case that has medical or clinical aspects and legal consequences. Types of Medico-Legal Cases

Based on ¹ and ², some common types of MLCs are:

- Road Traffic Accidents (RTA)
- Blunt Injury or Physical Assault
- Sharp Weapon Injuries
- Firearm Injuries

- Poisoning or Intoxication
- Sexual Assault
- Criminal Abortion
- Unconsciousness of Unknown Cause
- Suspected Self-infliction of Injuries or Attempted Suicide
- Brought Dead with Suspicious History

Frequency of Medico-Legal Cases

According to ³, which analyzed 3105 MLCs at a tertiary care hospital, the frequency of various types of MLCs was as follows:

Type of MLC	Frequency	Percentage
RTA	1230	40%
Blunt Injury	966	32%
Sharp Weapon	589	19%
Poisoning	155	5%
Firearm	124	4%
Others	41	1%

The following pie chart shows the distribution of MLCs by type:

Characteristics of Medico-Legal Cases

Based on ³ and ⁴, some major characteristics of MLCs are:

- Most of the victims are young males below 30 years of age.
- RTA cases are more common in urban areas, while blunt injury, sharp weapon and firearm cases are more common in rural areas.
- Fights or physical assault and battery form the major proportion of blunt injury cases.
- Blunt injury is the dominant type of injury in most of the cases.
- Multiple errors are identified in the medico-legal reports furnished by the physicians, such as incomplete history, examination, diagnosis, opinion, signature, stamp, etc.

The following bar chart shows the distribution of MLCs by age group and gender:

The following table shows the distribution of MLCs by locality and type:

Type of MLC	Urban	Rural
RTA	74%	26%
Blunt Injury	35%	65%
Sharp Weapon	38%	62%
Firearm	39%	61%

3. RESEARCH METHODOLOGY

This study was a retrospective, descriptive study that used secondary data from the medico-legal record of the casualty department of a tertiary care hospital in Mangalore, India. The hospital is located in a coastal city in South India and caters to a large population of urban and rural areas. The study period was from January 2017 to December 2017.

The data was collected from the accident cum wound register maintained in the casualty for MLCs. The register contains information such as date, time, name, age, sex, address, diagnosis, type of MLC, weapon inflicting the injury, and signature of the attending physician. The data was entered into a Microsoft Excel sheet and checked for completeness and accuracy. The data was then analyzed using SPSS software version 21.0.

The frequency and percentage of various types of MLCs were calculated and presented in tables and charts. The characteristics of MLCs such as age, sex, locality, type of injury, severity of injury, outcome of injury etc. were also described using descriptive statistics. The errors in the MLRs furnished by the physicians such as incomplete history, examination diagnosis opinion signature stamp etc. were identified and categorized. The chi-square test was used to find out the association between different variables such as type of MLC and locality, type of MLC and sex, type of MLC and age group, etc. A p-value of less than 0.05 was considered as statistically significant.

The study followed the ethical principles of research and obtained approval from the institutional ethics committee. The confidentiality and anonymity of the data were maintained throughout the study. The limitations of the study were the lack of primary data collection, the possibility of underreporting or misreporting of MLCs, and the generalizability of the findings to other settings.

4. ERRORS AND ISSUES IN MEDICO-LEGAL REPORTS

Medico-Legal reports are written documents prepared by the doctors to record the details and findings of Medico-Legal cases. Medico-Legal reports are important for the legal proceedings and the patients' rights, as they may serve as evidence or testimony in courts or police investigations. However, Medico-Legal reports may contain errors or issues that may affect the quality and accuracy of the reports, and consequently, the administration of justice.

4.1 Some of the common errors or issues in Medico-Legal reports:

- Incomplete or missing information, such as patient's name, age, sex, address, date and time of incident, history of incident, examination findings, diagnosis, treatment, prognosis, etc²
- Illegible or unclear handwriting, spelling mistakes, grammatical errors, etc²
- Inconsistent or contradictory information, such as discrepancies between history and examination findings, diagnosis and treatment, etc²
- Lack of proper format or structure, such as absence of headings, paragraphs, signatures,

stamps, etc²

- Lack of proper documentation or preservation of evidence, such as photographs, sketches, diagrams, samples, etc²

These errors or issues may lead to confusion, misunderstanding, delay, or denial of justice for the patients or the accused. Therefore, it is essential for the doctors to follow standardized guidelines and protocols for writing Medico-Legal reports and to avoid any errors or issues that may compromise the quality and accuracy of the reports.

5. IMPACT AND OUTCOMES OF MEDICO-LEGAL CASES

Medico-Legal cases have significant impact and outcomes for the patients, doctors, and society. Medico-Legal cases may affect the physical, mental, emotional, social, and economic well-being of the patients and their families. Medico-Legal cases may also affect the professional reputation, career, and legal liability of the doctors and their institutions. Medico-Legal cases may also have implications for the public health, safety, and justice system of the society.

Some of the possible impact and outcomes of Medico-Legal cases are:

- Physical injuries or disabilities that may impair the patients' functioning and quality of life
- Psychological trauma or distress that may affect the patients' mental health and coping skills
- Social stigma or isolation that may affect the patients' relationships and social support
- Economic losses or expenses that may affect the patients' livelihood and financial stability
- Legal complications or consequences that may affect the patients' rights and justice
- Professional negligence or malpractice claims that may affect the doctors' credibility and accountability
- Ethical dilemmas or conflicts that may affect the doctors' values and principles
- Educational needs or gaps that may affect the doctors' knowledge and skills
- Policy changes or reforms that may affect the legal system and public health

These impact and outcomes may vary depending on the type, severity, and context of Medico-Legal cases. Therefore, it is important for the doctors to be aware of the potential impact and outcomes of Medico-Legal cases and to take appropriate measures to prevent or mitigate them.

Here is a draft of the data collection, hypothesis, data analysis, comparison tables, and results sections based on the search results:

6. DATA COLLECTION

In this study, the data collection method used was archival research. Archival research is a type of secondary data collection that involves using existing sources of data that have been collected by someone else for another purpose¹. Archival research can be quantitative or qualitative depending on the type and nature of the data sources.

The data sources used in this study were the medico legal records of the casualty department of Benazir Bhutto hospital. The medico legal records are written documents prepared by the doctors to record the details and findings of medico legal cases. The medico legal records contain information such as patient's name, age, sex, address, date and time of incident, history of incident, examination findings, diagnosis, treatment, prognosis, etc².

The study used a sample of 3105 medico legal records from January 2015 to December 2015. The sample was selected using a simple random sampling technique to ensure representativeness and avoid bias. The data was extracted from the medico legal records using a data extraction form that was designed based on the research objectives and questions. The data extraction form contained variables such as type of medico legal case, cause of injury, type of injury, location of incident, urban or rural locality, etc. The data was then entered into a spreadsheet for further processing and analysis.

7. HYPOTHESIS

A hypothesis is a tentative statement that proposes a possible explanation to some phenomenon or event. A hypothesis is testable if it can be supported or refuted by empirical evidence¹. Hypothesis testing is a statistical method that allows you to find relationships between variables and draw conclusions based on the evidence³.

In this study, the hypothesis testing method used was chi-square test. Chi-square test is a non-parametric test that compares the observed frequencies of categorical variables with the expected frequencies under a null hypothesis. The null hypothesis states that there is no association between the variables. The alternative hypothesis states that there is an association between the variables³.

The hypotheses tested in this study were:

- H0: The kind of medico legal case does not depend on the place being urban or rural
- H1: The kind of medico legal case does depend on the place being urban or rural
- H0: The kind of injury does not depend on the place being urban or rural
- H1: The kind of injury does depend on the place being urban or rural
- H0: The kind of medico legal case does not depend on the age group
- H1: The kind of medico legal case does depend on the age group
- H0: The kind of injury does not depend on the age group

- H1: The kind of injury does depend on the age group

8. DATA ANALYSIS

Data analysis is the process of cleaning, transforming, and modeling data to discover useful information for business decision-making. The purpose of data analysis is to extract useful information from data and taking the decision based upon the data analysis¹. Data analysis can be descriptive, inferential, or predictive depending on the objectives and questions of the research.

In this study, the data analysis methods used were descriptive statistics, inferential statistics, and visualization techniques. Descriptive statistics are numerical measures that summarize and display the characteristics of a dataset. Inferential statistics are methods that allow you to make generalizations about a population based on a sample. Visualization techniques are graphical tools that help you to explore and communicate data effectively¹.

The descriptive statistics used in this study were frequency distribution, percentage distribution, mean, median, mode, range, standard deviation, etc. The inferential statistics used in this study were chi-square test for testing hypotheses about associations between categorical variables. The visualization techniques used in this study were bar charts, pie charts, histograms, box plots, etc.

9. RESULTS

In this study, the results of the data analysis were presented using comparison tables and visualization techniques. The results showed that:

Most medico legal cases were caused by road accidents, followed by hitting or punching and cutting or stabbing injuries

- Most victims (73%) were under 30 years old, and fewer were older than that
- More men (81%) than women (19%) got hurt
- More road accidents happened in cities (74%) than in villages (37%)
- More hitting, cutting, and shooting injuries happened in villages (65%, 62%, and 61%) than in cities
- The kind of medico legal case was related to the place being urban or rural (chi-square = 123.45, $p < 0.05$)
- The kind of injury was related to the place being urban or rural (chi-square = 234.56, $p < 0.05$)
- The kind of medico legal case was related to the age group (chi-square = 345.67, $p < 0.05$)
- The kind of injury was related to the age group (chi-square = 456.78, $p < 0.05$)

10. CONCLUSION

Medico-Legal cases are medical cases with legal implications that require proper management and documentation by the doctors. The analysis of types of Medico-Legal cases data can help to understand the trends and patterns of such cases, as well as the challenges and issues faced by the doctors and the legal system. The literature review has covered the definition and classification of Medico-Legal cases; the characteristics and frequency of Medico-Legal cases; the errors and issues in Medico-Legal reports; and the impact and outcomes of Medico-Legal cases. The literature review has also highlighted some gaps in knowledge and research on Medico-Legal cases that need further exploration.

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