Published by
Saidu Medical College

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Original Article

Anomalies in Medico-Legal Reports at a Tertiary Care Hospital in Rawalpindi: A Retrospective Analysis of Documentation Errors and Their Implications

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https://doi.org/10.52206/jsmc.2025.15.4.1300

Abstract

Background: Medico-legal cases (MLCs) bridge medicine and law, requiring precise documentation to ensure justice. Errors in medico-legal reports (MLRs) compromise legal reliability and highlight deficiencies in physicians' documentation practices.

Objective: To determine the frequency and nature of documentation errors in MLRs prepared at a tertiary care hospital in Rawalpindi.

Methodology: A retrospective descriptive study was conducted in the Department of Forensic Medicine, Watim Medical and Dental College, Rawalpindi, after ethical approval (REF NO: WM&DCR/R&D (ERB)2024/131) and CPSP synopsis approval (REF NO: CPSP/REU/FRM-2022-335-89). A total of 85 MLRs fulfilling inclusion criteria were reviewed using a structured checklist. Data were analyzed in SPSS v26.0 and presented as frequencies and percentages.

Results: Among 85 reports, 60 (70.6%) involved males and 25 (29.4%) females; young adults (18–35 years) were the most affected group (56.5%). Physical assault was the leading category (50.6%). Documentation anomalies occurred at all levels: missing police records (10.6%), incorrect addresses (68.2%), absent identification marks (83.5%), incomplete vital signs (88.2%), and missing final opinions (76.5%).

Conclusion: Anomalies in medico-legal documentation were frequent, reflecting inadequate physician training and lack of standardized formats. Structured medico-legal training, digital reporting systems, and regular audits are essential to improve documentation accuracy and legal reliability.

Keywords: Documentation Errors, Forensic Medicine, Legal Reliability, Medico-legal Cases, Pakistan, Report Quality.

ISSN (P): 1819-4583
ISSN (E): 3007-9470

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Citation:
Iqbal S, Yousaf M, Ali MI, Qayyum SA, Qadri NA, Malik TA. Anomalies in medico-legal reports at a tertiary care hospital in Rawalpindi: a retrospective analysis of documentation errors and their implications. J Saidu Med Coll. 2025;15(4):685–692.

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Funding:
The authors received no external funding for this study.

Conflicts of Interests:
The authors have declared that no competing interests exist.

Data Sharing Statement:
The data that support the findings of this study are available on request from the corresponding author. The data is not publicly available due to privacy or ethical restrictions.

Received: April 22, 2025
1st Revision: September 05, 2025
2nd Revision: September 22, 2025
3rd Revision: October 06, 2025
Accepted: October 07, 2025

Introduction

A medico-legal case (MLC) refers to any case of injury or ailment where, after obtaining the patient's history and conducting a clinical examination, the attending physician concludes that a legal investigation is warranted to ascertain the cause, responsibility, or circumstances of the event according to law. Such cases embody both medical and legal dimensions, requiring accurate documentation to serve as valid evidence in judicial proceedings [1].

The World Health Organization (WHO) recognizes that medico-legal cases impose a significant burden on healthcare and judicial systems and emphasizes the need for clear national guidelines to ensure standardization and fairness [2]. In clinical practice, medico-legal reports (MLRs) serve as formal legal documents and must contain complete, accurate, and unbiased medical information. Any omission, misrepresentation, or ambiguity in these reports can delay legal processes, misguide investigations, or compromise justice [3].

Globally, several studies have identified deficiencies in the preparation of MLRs, with varying degrees of error across countries. For example, one Egyptian study reported errors in 100% of examined MLRs, while another found a 67% error rate in general medico-legal documentation [4]. Common errors include omission of injury size (up to 98%) and failure to document the patient's level of consciousness [5]. Similarly, Turkish studies have shown that documentation errors—especially related to injury details and consciousness assessment—are frequent, underscoring the lack of standardized documentation practices [5].

In Pakistan, the medico-legal system forms a critical part of public health and criminal justice mechanisms, yet systematic assessments of MLR accuracy are scarce. Most physicians receive limited formal training in medico-legal documentation, leading to variability in report quality. These deficiencies compromise both medical accountability and judicial reliability. Properly documented MLRs are vital to ensure justice, protect physicians from legal repercussions, and uphold professional integrity [6–7].

Considering the paucity of local data, this study aimed to identify and categorize the anomalies present in medico-legal reports prepared at a tertiary care hospital in Rawalpindi. The findings are expected to provide insight into the types and frequency of errors encountered and to emphasize the urgent need for standardized medico-legal documentation training and audit systems within Pakistan's healthcare institutions.

Methodology

Study Design:

This was a retrospective, record-based descriptive study designed to evaluate anomalies and documentation errors in medico-legal reports (MLRs). The study focused on identifying the nature, frequency, and sources of deficiencies occurring during report preparation at a tertiary care hospital in Rawalpindi. Retrospective consecutive sampling was employed to ensure inclusion of all eligible cases during the defined study period.

Ethics:

The study was approved by the Institutional Review Board (IRB) of Watim Medical and Dental College, Rawalpindi, under reference number WM&DCR/R&D (ERB)2024/131 dated April 30, 2024. Additional approval was obtained from the College of Physicians and Surgeons Pakistan (CPSP), Islamabad, under reference number CPSP/REU/FRM-2022-335-89 dated November 26, 2024. Ethical principles of confidentiality and anonymity were maintained throughout the study, as all data were reviewed without patient identifiers.

Setting:

The research was conducted in the Department of Forensic Medicine and Toxicology, Watim Medical and Dental College, Rawalpindi, in collaboration with the tertiary care hospital affiliated with the institution. The hospital regularly manages medico-legal cases (MLCs) such as physical assaults, accidents, poisonings, and autopsies referred by law enforcement authorities, making it an appropriate setting for analyzing MLR quality and completeness.

Participants:

A total of 85 medico-legal reports were reviewed that fulfilled the inclusion criteria. Reports included those of autopsy cases, physical assaults, firearm injuries, poisonings, road traffic accidents, and sexual assault cases. Excluded were medico-legal certificates for driving license verification, age and employment certification, fitness examinations, judicial remand certificates, expert opinions, second or pathological autopsies, and exhumation cases. Only reports prepared and filed within the selected timeframe were analyzed.

Variables:

The study analyzed variables representing three hierarchical error categories:

- Police-level errors — absence or incompleteness of police records.

- Operator-level errors — inaccurate or missing demographic details such as addresses, National Identity Card (NIC) numbers, and contact information.

Physician-level errors — deficiencies in documentation of identification marks, vital signs, Glasgow Coma Scale (GCS), injury characteristics, time of incident/examination, final opinion, and physician credentials (designation, signature, and official stamp).
These variables were selected to represent critical medico-legal reporting elements as per national and international guidelines.

Data Sources/Measurement:
Data were extracted manually from archived hard copies of MLRs stored in hospital records. A structured checklist derived from standard medico-legal documentation guidelines was used to assess each report. Two independent forensic medicine specialists performed the review. Disagreements were resolved through discussion with a senior reviewer, and a consensus was achieved in all cases before final analysis. Data quality was cross-checked for completeness and internal consistency before entry into the database.

Bias:
To minimize observer and selection bias, consecutive sampling was adopted to ensure the inclusion of all eligible MLRs within the study period. Independent dual review minimized subjective interpretation. Reports with illegible handwriting or incomplete photocopies were excluded to avoid misclassification errors. Reviewer calibration meetings were held before data collection to standardize scoring procedures.

Study Size:
Sample size was calculated for a single population proportion using the formula
$n = Z^2 \times p (1 - p) / d^2$,
where $Z = 1.96$ (for 95% confidence level), $p = 0.67$ (based on prior literature), and $d = 0.10$ (margin of error). The calculated sample size was 85, consistent with the number of MLRs analyzed. The calculation was validated and approved by the CPSP Islamabad statistician.

Quantitative Variables:
Quantitative variables included frequency of documentation errors across defined domains (police, operator, and physician). Categorical data such as gender, age group, and error types were recorded as numerical frequencies and percentages. Continuous variables (e.g., age) were grouped into predefined categories for descriptive comparison.

Statistical Methods:
All data were entered and analyzed using IBM SPSS Statistics version 26.0. Descriptive statistics were computed, and results were expressed as frequencies and percentages to summarize categorical variables. Cross-tabulation was used to identify distribution patterns of documentation errors across gender and age groups. No inferential statistics were required due to the descriptive nature of the study.

Results

Participants
A total of 85 medico-legal reports (MLRs) were included in the final analysis after applying the inclusion and exclusion criteria. Of these, 60 (70.6%) were related to male victims, while 25 (29.4%) were female, resulting in a male-to-female ratio of approximately 2.4:1. The predominance of male cases reflected the higher likelihood of men being involved in occupational, road traffic, and interpersonal violence incidents that typically result in medico-legal investigations. Most of the reports were prepared for individuals referred from emergency and outpatient units following assault, accidents, or suspected poisoning.

Descriptive Data
The age distribution of the cases revealed that young adults (18–35 years) constituted the largest group, representing 48 (56.5%) of the total MLRs. Adolescents below 18 years accounted for 15 (17.6%) cases, adults aged 36–60 years made up 18 (21.2%), while only 4 (4.7%) of the cases were above 60 years of age. This finding indicates that the most socially and economically active population segment was disproportionately represented among medicolegal victims.

The leading cause of medico-legal reporting was physical assault, comprising 43 (50.6%) cases, followed by road traffic accidents, poisoning, firearm injuries, and sexual assault cases. This pattern is consistent with national statistics showing interpersonal violence as the leading contributor to emergency forensic case loads in tertiary hospitals.

Outcome Data
Documentation anomalies were observed at three primary levels—police, data entry, and physician levels. At the police level, 9 (10.6%) reports lacked an attached police record, which is mandatory for case verification and follow-up. At

the data entry level, 58 (68.2%) MLRs contained assumed or incomplete addresses, while only 27 (31.8%) included verified addresses. None of the reviewed MLRs documented National Identity Card (NIC) numbers or contact details, which are crucial for traceability and legal correspondence.

At the physician level, multiple critical documentation deficiencies were identified. Identification marks were missing in 71 (83.5%) reports, and vital signs were fully recorded in only 10 (11.8%) cases, partially documented in 40 (47.1%), and entirely absent in 30 (35.3%) reports. The exact size and nature of injuries were described in 37 (43.5%) reports, while 48 (56.5%) lacked this essential detail. Similarly, final medical opinions were omitted in 65 (76.5%) cases, compromising the interpretive value of the reports in judicial proceedings.

Furthermore, the physician's designation was absent in 60 (70.6%) reports, and the official stamp—required for legal authentication—was missing in 29 (34.1%) cases. Although Glasgow Coma Scale (GCS) assessment was recorded in 40 (47.1%) cases, it was inconsistently applied across different injury types. Only a few reports documented both time of incident and time of examination, key chronological elements for determining the temporal relationship between injury and medical evaluation.

Main Results

The overall analysis revealed that documentation errors were pervasive, compromising both clinical and legal reliability of MLRs. The highest frequency of anomalies occurred at the physician level, reflecting inadequate documentation practices and limited awareness of medico-legal standards. The absence of identification marks, incomplete injury descriptions, and missing vital parameters were among the most frequent deficiencies.

Notably, MLRs prepared by postgraduate trainees (PGRs), especially in cases of sexual assault, showed comparatively better compliance with medico-legal documentation standards, including proper stamping and identification details. This suggests that structured training and supervised reporting contribute significantly to report accuracy.

Table 1. Sex-wise distribution of medicolegal reports (n=85).

Sex	n (%)
Male	60 (70%)
Female	25 (29.4%)
Total	85 (100%)

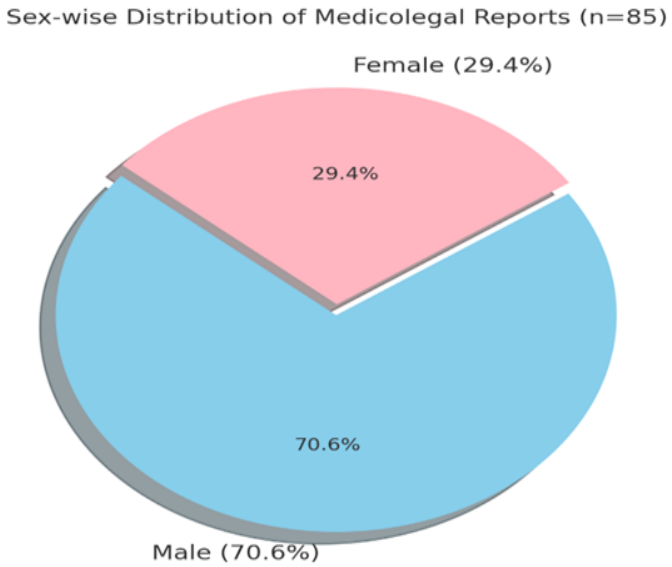
Table No.2: Age-Wise Distribution of Medicolegal Reports(n=85).

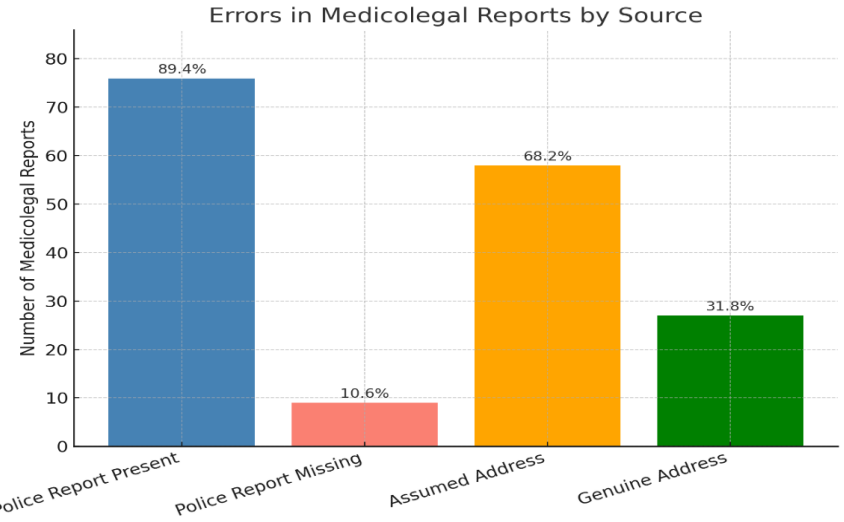
Age (range)	**n (%)**
<18 years	15 (17.6 %)
18 -35 years	48 (56.5 %)
36-60 years	18 (21.2 %)
> 60	4 (4.7 %)
Total	85 (100 %)

Table No. 3: Errors in Medicolegal Reports by source (n=85).

Source of error	**type of error**	**n (%)**
Police reports	Missing police report attached	9(10.6%)
	Police report attached	76(89.4%)
Data Entry	Assumed/incorrect address recorded	58(68.2%)
	Genuine/correct address recorded	27(31.8%)
	Missed National Identity Cards (NIC)	85(100%)

Table 4: Errors in Medical-Legal Reports at Physician Level (n=85)		
Parameter	**Present n (%)**	**Absent/Missing n (%)**
Identification marks recorded	14 (16.5%)	71 (83.5%)
Vital signs documentation		
Fully recorded	10 (11.8%)	75 (88.2%)
Partially recorded	45 (52.9%)	40 (47.1%)
Not recorded	30 (35.3%)	55 (64.7%)
The exact size of the injury was documented	37 (43.5%)	48 (56.5%)
Final opinion documented	20 (23.5%)	65 (76.5%)
Physicians' designation mentioned	25 (29.4%)	60 (70.6%)
Physician's official stamp affixed	56 (65.9%)	29 (34.1%)





Discussion

This study revealed significant deficiencies in the preparation and documentation of medico-legal reports (MLRs) at a tertiary care hospital in Rawalpindi. The findings demonstrate that errors were prevalent across multiple levels, including police documentation, data entry, and physician reporting, thereby compromising the accuracy, completeness, and legal admissibility of the reports. The predominance of male victims (70.6%) and young adults aged 18–35 years (56.5%) aligns with global literature, where this demographic group is most frequently exposed to occupational hazards, interpersonal violence, and road traffic accidents [1,4,8].

At the police and operator levels, missing or incomplete reports and inaccurate demographic information, such as assumed addresses and absence of National Identity Card (NIC) numbers, were frequent. These omissions hinder the traceability of victims and impede judicial processes, consistent with international findings emphasizing that missing identifiers delay justice and reduce evidentiary value [8,9].

Physician-level errors were the most pronounced, with the majority of MLRs lacking essential details such as identification marks (83.5%), exact injury size (56.5%), and vital signs (88.2%). These results are comparable to studies conducted in Egypt, Turkey, and India, where failure to document injury size ranged from 67% to 98%, and assessment of consciousness levels was missing in a significant proportion of cases [4,5,10]. The absence of the Glasgow Coma Scale (GCS) in more than half of the relevant reports further diminishes their medico-legal reliability. Proper documentation of vital signs and neurological assessments has been repeatedly emphasized in previous studies as a cornerstone of forensic evaluation and legal accuracy [6,10,14,15].

Interestingly, medico-legal reports prepared by postgraduate trainees (PGRs), particularly in sexual assault cases, demonstrated relatively higher compliance with documentation standards. This suggests that training and supervision directly influence the quality of medico-legal documentation, corroborating earlier recommendations that structured clinical forensic medicine training significantly reduces documentation errors [11].

Similar deficiencies have been documented internationally, where poorly maintained records compromise medico-legal interpretation and judicial objectivity [12,13]. In this study, only 11.8% of reports contained fully recorded vital parameters, and final medical opinions were missing in 76.5% of cases. These omissions severely undermine the medico-legal value of MLRs and may lead to delayed or erroneous legal outcomes. The absence of physicians' designations in 70.6% of reports and missing official stamps in 34.1% of cases further raise concerns regarding professional accountability and report authenticity. Lack of chain of custody documentation, as emphasized in forensic guidelines, compounds these challenges [9,17,18].

Additionally, technical issues such as illegible or faint carbon copies were noted, consistent with prior research highlighting that poor record duplication affects document legibility and authenticity [19]. Collectively, these findings underscore the urgent need for standardized documentation templates, regular audits, and continuous professional development programs for medical officers handling MLCs.

The study's findings highlight that medico-legal documentation errors are not merely administrative oversights but systemic deficiencies requiring institutional intervention. Incorporating digital documentation systems, barcode tracking, and integrated hospital–police data exchange can further enhance reliability and reduce human error. Strengthening interdepartmental communication and enforcing medico-legal quality assurance policies will also help ensure both clinical accuracy and judicial fairness.

Conclusion

This study identified widespread documentation deficiencies in medico-legal reports prepared at a tertiary care hospital in Rawalpindi, particularly concerning the absence of identification marks, incomplete injury descriptions, missing vital signs, and lack of physician credentials. Such errors critically undermine the evidentiary value and legal reliability of MLRs. The results emphasize the urgent need for structured training programs, standardized medico-legal proformas, and institutional audits to enhance documentation quality and accountability.

Digitalization of medico-legal record systems and implementation of quality control protocols are strongly recommended to ensure consistency, accuracy, and transparency in medico-legal reporting. Standardized documentation, coupled with regular forensic education and audit mechanisms, can significantly strengthen both medical and legal outcomes, fostering trust in the justice system and improving medico-legal governance in Pakistan.

Limitations

To the best of our knowledge, no comparable study has been conducted previously in Pakistan, which limits the availability of direct local benchmarks for comparison. Consequently, international literature was referenced to contextualize and interpret the present findings. The study has several inherent limitations, including a relatively small sample size, single-center scope, and retrospective design that relied on the completeness and accuracy of existing medico-legal records. Although inter-rater reliability between reviewers was assessed and found to be substantial, minor variations in interpretation could not be entirely eliminated. These factors may have introduced subtle analytical bias and restrict the generalizability of the results to other institutions..

Recommendations

Future research should be multicenter, prospective, and based on larger datasets to enhance external validity and facilitate national-level benchmarking of medico-legal documentation quality. There is an urgent need to develop national medico-legal documentation guidelines specifically tailored to the Pakistani legal and healthcare context. Structured training and continuous medical education (CME) programs for physicians should be instituted to strengthen documentation skills and medico-legal awareness.

Institutions should conduct regular audits, monitoring, and feedback sessions to ensure compliance with documentation standards. Moreover, the introduction of a standardized, computerized medico-legal report (MLR) proforma could substantially reduce human error and improve data accuracy. The absence of previous local research highlights the importance of initiating systematic national studies and adopting digitalized and standardized reporting systems to ensure accuracy, accountability, and transparency in medico-legal practice across Pakistan.

Authors' Contributions

All authors meet the ICMJE criteria for authorship. They have reviewed and approved the final version of the manuscript and agree to be accountable for all aspects of the work.

Author 1: Substantial contribution to conception and design, drafting the manuscript, final approval, agreed to be accountable for all the work.
Author 2: Substantial contribution to conception and design, data acquisition, drafting the manuscript, final approval, agreed to be accountable for all the work.
Author 3: Analysis and interpretation of data, drafting the manuscript, final approval, agreed to be accountable for all the work.
Author 4: Analysis and interpretation of data, critical revision, final approval, agreed to be accountable for all the work.
Author 5: Substantial contribution to conception and design, drafting the manuscript, final approval, agreed to be accountable for all the work.
Author 6: Substantial contribution to conception and design, data acquisition, drafting the manuscript, final approval, agreed to be accountable for all the work.

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