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Perspectives of Medical Practitioners in India on Medicolegal Teleguidance by Forensic Medical Experts: A Mixed-Methods Approach

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Mukesh R [1], Amaravathi Uthayakumar [2], Ambika Prasad Patra [3], Gautam Roy [4], Kumaran M [5]

1. Forensic Medicine and Toxicology, All India Institute of Medical Sciences, Madurai, IND 2. Emergency Medicine, Jawaharlal Institute of Postgraduate Medical Education and Research, Pondicherry, IND 3. Forensic Medicine and Toxicology, Jawaharlal Institute of Postgraduate Medical Education and Research, Pondicherry, IND 4. Community and Family Medicine, Jawaharlal Institute of Postgraduate Medical Education and Research, Pondicherry, IND 5. Forensic Medicine and Toxicology, Jawaharlal Institute of Postgraduate Medical Education and Research, Karaikal, IND

Corresponding author: Mukesh R, mukeshfmt22@gmail.com

Abstract

Background

Medicolegal cases (MLCs) sit at the interface of healthcare and the justice system, demanding accurate documentation and legal compliance, yet India's forensic medicine workforce is grossly outnumbered by its clinical workforce. This gap has widened further with the new criminal laws, the Bharatiya Nyaya Sanhita (BNS), Bharatiya Nagarik Suraksha Sanhita (BNSS), and Bharatiya Sakshya Adhiniyam (BSA), which heighten medicolegal risk for non-specialist practitioners, particularly in peripheral settings. Teleguidance from forensic medical experts has been proposed as one way to address this gap. This study explored the perspectives of registered medical practitioners in Tamil Nadu and Puducherry on the need, utility, and implementation of medicolegal teleguidance by forensic medical experts.

Methodology

A convergent parallel mixed-methods design informed by Good Reporting of A Mixed Methods Study (GRAMMS) principles was used. Quantitative data were collected through a validated online questionnaire from practicing medical practitioners who handle MLCs, recruited by convenience and referral sampling (266 responses; 265 analyzed after one exclusion). Qualitative data were collected through semi-structured interviews with a purposive subsample of 25 survey respondents (9.4%). Descriptive statistics and Pearson's chi-square tests with Bonferroni correction were used for quantitative data. Interview transcripts were analyzed by inductive thematic analysis, and the two strands were integrated at the interpretation stage.

Results

Of 265 practitioners, 157 (59.2%) reported two years or less of MLC-handling experience, and 49 (18.5%) had postponed medicolegal documentation while awaiting guidance. Most agreed that teleguidance could help in handling MLCs (209, 78.9%) and improve the efficiency of report preparation (224, 84.5%), and 219 (82.6%) had a moderate-to-high composite need score. Overall, 246 (92.8%) were comfortable with teleconsultation technology, and 238 (89.8%) wanted structured training. Qualitative analysis identified six themes: challenges in documentation, credibility of forensic expertise, benefits and limits of real-time consultation, ethical and legal concerns, infrastructural barriers, and training and policy frameworks. Need showed a nominal association with current professional role ($\chi^2 = 15.33$, df = 6, $p = 0.018$) that did not remain significant after Bonferroni correction. Teleguidance was perceived as most useful in clinico-forensic toxicology, traumatology, and medicolegal report writing.

Conclusion

Practitioners in this sample perceived a moderate-to-high need for medicolegal teleguidance by forensic experts and reported high readiness to adopt it, especially for report writing and for toxicology and trauma cases. Teleguidance should complement, not replace, direct examination and independent medicolegal assessment by the treating doctor. Its effects on documentation quality, efficiency, and medicolegal outcomes were not assessed in this study. These should be tested in prospective pilot studies within a clear legal framework aligned with BNS/BNSS/BSA, using secure digital infrastructure and, potentially, integration with existing platforms such as eSanjeevani and MedLEaPR.

Categories: Forensic Medicine, Quality Improvement, Healthcare Technology
Keywords: clinical forensic medicine, esanjeevani, forensic medicine expert, healthcare ethics and law, medicolegal cases, medicolegal experts, medleapr, teleconsultation services, telehealth usability questionnaire, telemedicine services

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Introduction

The management of medicolegal cases (MLCs) is part of the routine practice of registered medical practitioners (RMPs) in India [1]. However, specialists in forensic medicine and toxicology (FMT) number only 5,507 (2022 teaching-faculty data) against 13,08,009 registered allopathic doctors nationally as of June 2022 [2,3], about 0.42% of the practicing workforce. The national FMT postgraduate trainee index reported in 2024 was as low as 0.054, with several states recording a zero index, reflecting a structurally inadequate FMT specialist pipeline [4]. This scarcity coincides with a substantial medicolegal caseload: offences affecting the human body accounted for 32.5% of IPC crimes in India in 2022 [5], while, per National Judicial Data Grid figures accessed on August 11, 2024, 66% of criminal cases in district and taluka courts remained pending beyond a year, with 58% recorded at the evidence stage [6]. India has 37,725 public health facilities, comprising 29,899 primary health centers, 5,568 community health centers, 1,255 sub-divisional hospitals, and 1,003 district hospitals [7]. This shortage of FMT experts poses particular challenges for peripheral and remote centers with limited timely access to forensic expertise, where medical officers are frequently uncertain in distinguishing MLC from non-MLC cases [8].

The Bharatiya Nyaya Sanhita (BNS), Bharatiya Nagarik Suraksha Sanhita (BNSS), and Bharatiya Sakshya Adhiniyam (BSA), notified in December 2023 and in force from July 1, 2024, replaced the IPC, CrPC, and Indian Evidence Act, respectively, heightening the need to address this gap [9,10]. Telemedicine already offers a template for bridging such access gaps [11,12]. The Government of India's eSanjeevani platform, serving over 100.11 million patients through 115,234 spokes and 15,731 hubs as of February 2023 [13], demonstrates the feasibility of scaled teleconsultation, but no equivalent legally framed platform exists for medicolegal teleguidance or AI integration [14,15]. Prior studies report that fewer than half of resident doctors know when to file an MLC, and interns often avoid MLCs from legal apprehension [16-18], but practitioner perspectives on a dedicated teleguidance model remain unexplored.

The primary objective of this study was to estimate the self-reported need for medicolegal teleguidance by forensic medical experts among RMPs handling MLCs in Tamil Nadu and Puducherry. The secondary objectives were (i) to explore associations between need and participant characteristics (gender, MLC experience, current role and sector) and to describe preferred implementation features, and (ii) to explore practitioners' attitudes and perceptions regarding the utility, barriers, and implementation of medicolegal teleguidance through qualitative interviews.

Materials And Methods

Study design

A convergent parallel mixed-methods design (Figure *1*), informed by Good Reporting of A Mixed Methods Study (GRAMMS) principles [19], was used. The quantitative strand estimated the frequency of need and technological readiness across the sample (primary objective and first secondary objective), while the qualitative strand explored practitioner reasoning, particularly around legal liability and infrastructural gaps (second secondary objective). The two strands were integrated at the interpretation stage by comparing quantitative results and qualitative themes side by side; divergences are reported as such rather than forced into agreement.

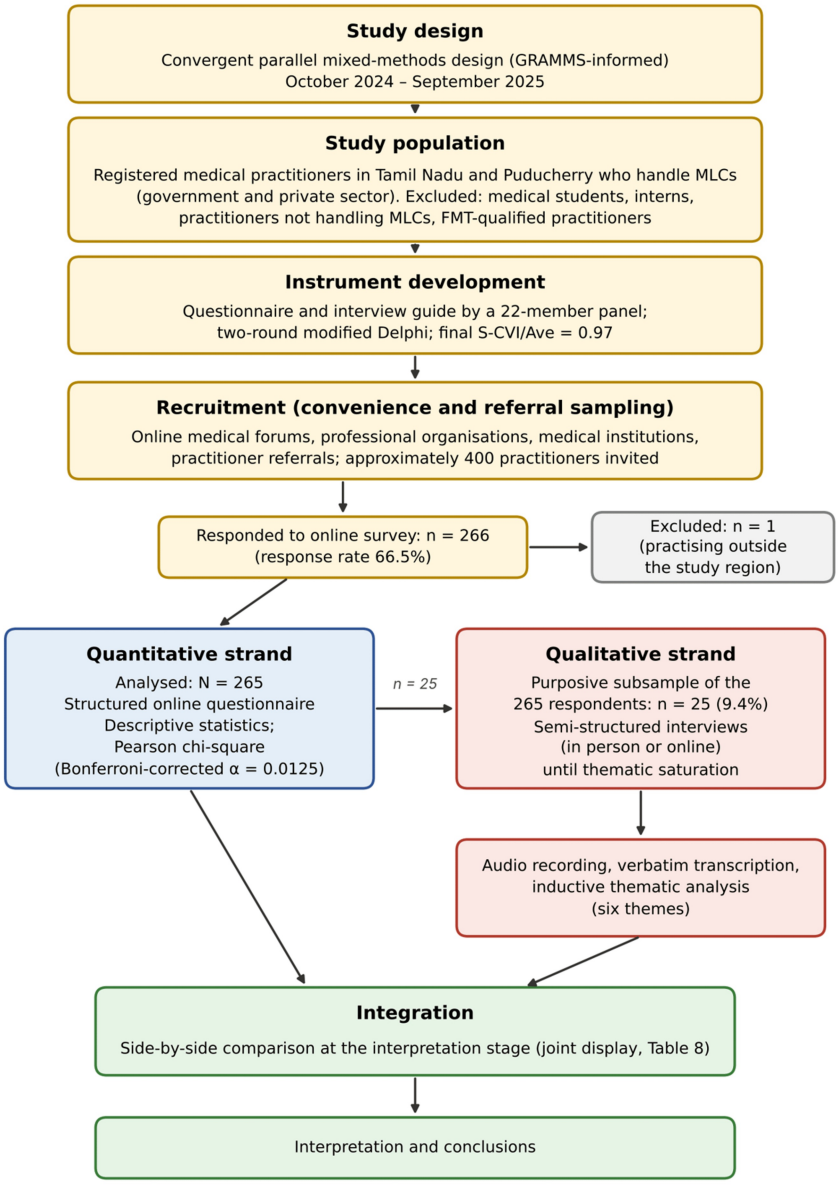


FIGURE 1: Study methodology and participant flow

MLC: medico-legal case, FMT: forensic medicine and toxicology, S-CVI/Ave: scale-level content validity index (average), GRAMMS: Good Reporting of A Mixed Methods Study.

Study population and setting

The study population comprised government and private-sector RMPs in Tamil Nadu and Puducherry who encounter MLCs in routine work. Medical students, interns not yet practicing independently, practitioners who do not encounter MLCs, and practitioners already qualified in FMT were excluded. The study was conducted from October 2024 to September 2025.

Questionnaire development and validation

The survey instrument and interview guide were developed by a panel of 22 medical doctors, comprising FMT subject experts, specialists from target disciplines, and representatives of the study population; panel members are listed in the Acknowledgements. The questionnaire was validated through a two-round modified Delphi consensus process. Content validity was evaluated by content experts (n = 12) using item-level and scale-level content validity indices (I-CVI and S-CVI) [20] and Lawshe's Content Validity Ratio (CVR) [21], with items retained if I-CVI ⩾ 0.78 and CVR met critical thresholds based on exact one-tailed binomial probabilities [22]. Face validity was assessed by the full panel using a Face Validity Index (FVI). Round 1 yielded an S-CVI/Ave of 0.76 and a Lawshe CVI of 0.82 (S-FVI/Ave = 0.84). After item refinement, 25

items were re-rated in Round 2, achieving a final S-CVI/Ave of 0.97 and full Delphi consensus (⩾75% agreement, IQR ⩽ 1). Criterion validity was not evaluated, as the instrument measures perceptual and attitudinal constructs rather than predicting an external criterion. The final questionnaire is given in Appendix A.

Participant recruitment and sampling (quantitative strand)

The validated questionnaire was administered through Google Forms (Google, Mountain View, CA, USA) with click-through consent. Convenience and referral sampling was used because of the practical difficulty of reaching a geographically dispersed practitioner population. The survey link was disseminated through online medical forums and practitioner WhatsApp groups, professional organizations, medical institutions (including JIPMER, IGMCRI, Saveetha Medical College, Chettinad Medical College, and Government Cuddalore Medical College), and practitioner referrals. Approximately 400 eligible practitioners were invited, of whom 266 responded (response rate 66.5%). One response was excluded because the respondent practiced outside the study region, leaving 265 responses for analysis (Figure *1*). Name, e-mail, and Medical Council registration number were mandatory fields, used to confirm that respondents were registered practitioners and to avoid duplicate responses.

Sample size

The sample size was calculated a priori for estimating a single proportion, using $n = Z^2p(1-p)/d^2$, with Z = 1.96 (95% confidence), an assumed proportion p = 0.5 (maximum variance, as no prior estimate was available), and absolute precision d = 0.05. This gave 384.2, rounded up to a target of 385. The target was not achieved within the approved study period: 265 participants were analyzed, 31.2% below target. Likely reasons were low survey response among busy clinicians in emergency and peripheral settings; the requirement to provide Medical Council registration details, which may have discouraged some invitees given the medico-legal subject; the number of questions; and the strict eligibility criteria. With 265 participants, the subgroup comparisons had limited statistical power.

Qualitative strand

For the qualitative component, 25 of the 265 survey respondents (9.4%) were purposively selected for maximum variation in specialty, sector, and MLC experience. Interviewees came from emergency medicine, general surgery, orthopedics, radiology, laboratory medicine (pathology/biochemistry), obstetrics and gynecology, public health, and nephrology. The interview guide (Appendix B), developed alongside the questionnaire by the same 22-member panel, covered 10 domains of about five minutes each, plus introduction and closing (approximately 60 minutes in total). Interviews were conducted in person or online until thematic saturation was reached, judged as the point at which no new codes emerged in three consecutive interviews. Consent was obtained by e-signature, recorded verbal consent, e-mail, or digital-platform confirmation, with the right to withdraw at any time.

Composite need score

A composite need score was calculated as the unweighted sum of five questionnaire items: Q8, frequency of felt need for teleguidance (Never = 0, Rarely = 1, Occasionally = 2, Frequently = 3, Very frequently = 4); Q9, belief that teleguidance helps efficient MLC handling; Q10, belief that teleconsultation improves the efficiency of report preparation (each on a five-point Likert scale from Strongly disagree = 1 to Strongly agree = 5); Q11, previous discussion of the need with colleagues, seniors, or administrators (No = 0, Maybe = 1, Yes = 2); and Q12, preferred consultation approach (Not required or In-person consultation better = 0; Teleguidance better, Combination of both methods or Case-to-case basis = 3). Possible scores range from 2 to 19. Scores were categorized as low (2-9), moderate (10-15), or high (16-19) need, using cutoffs defined by the investigators and anchored to item responses: the high band (16-19) cannot be reached without agreement on the belief items (Q9, Q10) combined with frequent need, prior discussion, or a preference for teleguidance involvement. The composite is a pragmatic summary index developed for this study and was not validated against an external criterion. As the five items capture different aspects of need (frequency, beliefs, past behavior, and preference), the score was treated as a summary index, and internal-consistency testing was not considered appropriate. Item-level distributions are reported alongside the composite.

Statistical analysis

Quantitative data were analyzed using IBM SPSS Statistics for Windows, Version 19 (Released 2010; IBM Corp., Armonk, NY, USA). Categorical variables are presented as frequencies and percentages of the 265 analyzed respondents; for multiple-response items, respondents could select more than one option, so percentages may total more than 100%. Associations between the need category and gender, MLC experience, current role, and sector were tested with Pearson's chi-square test. Because four association tests were performed, a Bonferroni-corrected significance threshold of $p < 0.0125$ (0.05/4) was applied, and Bonferroni-adjusted p-values are reported. Effect size is reported as Cramér's V. Because some cells had expected counts below 5, Monte Carlo permutation p-values (20,000 permutations) were calculated as a sensitivity analysis. Associations are interpreted as exploratory. The 95% confidence interval for the main proportion was calculated by the Wilson method.

Qualitative analysis

Interviews were audio-recorded with consent and transcribed verbatim and, where conducted in Tamil, translated into English. Two authors (MR and AU) independently coded the transcripts using inductive thematic analysis following Braun and Clarke's six phases [23]. Codes were grouped into themes covering medicolegal reporting, teleconsultation utility, ethical concerns, infrastructure limitations, and technology integration, and refined through discussion, with disagreements resolved by a third author (KM).

Ethics

Ethical clearance was obtained from the Institutional Ethics Committee for Observational Studies, JIPMER, Puducherry (approval no. JIP/IEC-OS/2024/322, dated 25-10-2024).

Results

Demographics and professional profile

Most survey participants were male (161, 60.8%) and worked in government institutions (192, 72.5%) (Table *1*). Junior resident was the most common current role (86, 32.5%). By broad specialization, 101 (38.1%) participants belonged to medical departments and 78 (29.4%) to surgical departments.

Variable	Category	n (%)/mean ± SD
Age (years)	-	32.15 ± 6.88
Gender	Male	161 (60.8)
	Female	104 (39.2)
Sector of work	Government	192 (72.5)
	Private	73 (27.5)
Experience in managing MLCs (years)	<1 year	82 (30.9)
	1-2 years	75 (28.3)
	3-5 years	51 (19.2)
	5-10 years	37 (14.0)
	>10 years	20 (7.5)

TABLE 1: Sociodemographic and professional characteristics of participants (N = 265)

MLCs: medicolegal cases.

MLC management

Over a quarter of respondents (69, 26.0%) reported taking more than 24 hours to reach a conclusion in an MLC (Table *2*). Overall, 49 (18.5%) had postponed documentation while awaiting guidance, and a further 33 (12.5%) were uncertain whether they had done so (Table *3*). Ninety (34.0%) reported having felt a lack of proper medicolegal guidance while deposing in court. The most frequently handled case types (multiple responses allowed) were vehicular, factory, or other unnatural accidents (167, 63.0%), injuries and burns (163, 61.5%), and suspected or evident poisoning or intoxication (141, 53.2%).

Response	n (%)
Less than 24 hours	196 (74.0)
More than 24 hours	69 (26.0)

TABLE 2: Time taken to reach a conclusion in handling MLCs (N = 265)

MLCs: medicolegal cases.

Response	n (%)
No	183 (69.1)
Yes	49 (18.5)
Maybe	33 (12.5)

TABLE 3: Postponement of medicolegal cases due to lack of guidance (N = 265)

Perceived need for teleguidance

Most respondents agreed or strongly agreed that teleguidance could help in handling MLCs (209, 78.9%) and could improve the efficiency of preparing medicolegal reports (224, 84.5%) (Table *4*). Most reported at least occasional need for such support (Table *5*), and 219 (82.6%; 95% CI 77.6%-86.7%) had a moderate-to-high composite need score (Table *6*). Readiness was also high: 246 (92.8%) were comfortable using the required technology, and 238 (89.8%) wanted structured training. Most favored a combined or case-to-case approach over purely in-person or purely remote consultation. These findings reflect participants' perceptions and beliefs; the actual effect of teleguidance on MLC handling or reporting was not measured.

Variable	Strongly agree, n (%)	Agree, n (%)	Neutral, n (%)	Disagree, n (%)	Strongly disagree, n (%)
Helps in handling MLC	71 (26.8)	138 (51.7)	40 (15.1)	7 (2.6)	9 (3.4)
Improves efficiency of MLC reporting	82 (30.9)	142 (53.2)	31 (11.7)	4 (1.5)	6 (2.3)

TABLE 4: Perception towards teleguidance in MLC handling (N = 265)

Agreement (strongly agree + agree): 209 (78.9%) for handling MLCs and 224 (84.5%) for MLC reporting.

MLCs: medicolegal cases.

Frequency of need	n (%)
Never (0 times/year)	69 (26.0)
Rarely (1-2/year)	71 (26.8)
Occasionally (3-5/year)	87 (32.8)
Frequently (6-10/year)	30 (11.3)
Very frequently (>10/year)	8 (3.0)

TABLE 5: Frequency of need for teleguidance in handling MLCs (N = 265)

MLCs: medicolegal cases.

Need category (score range: 2-19)*	n (%)
Low (score 2-9)	46 (17.4)
Moderate (score 10-15)	179 (67.5)
High (score 16-19)	40 (15.1)

TABLE 6: Overall need for teleguidance (composite score category) (N = 265)

Composite score = unweighted sum of Q8 (0-4), Q9 (1-5), Q10 (1-5), Q11 (0-2), and Q12 (0-3); scoring rules and cutoffs are described under Materials and Methods.

Need for teleguidance showed nominal associations with current role ($\chi^2 = 15.33$, df = 6, p = 0.018) and gender ($\chi^2 = 6.63$, df = 2, p = 0.036) (Table 7); service doctors and male respondents more often fell in the high-need category. However, neither association remained statistically significant after Bonferroni correction for four comparisons (adjusted p = 0.071 and 0.145, respectively; threshold p < 0.0125), and effect sizes were small (Cramér's V = 0.17 and 0.16). MLC experience (p = 0.132) and sector of work (p = 0.681) showed no association. Monte Carlo permutation p-values were similar (role 0.017, gender 0.039, experience 0.132, sector 0.667). These associations are therefore exploratory and hypothesis-generating.

Variable	Category	Low n (%)	Moderate n (%)	High n (%)	χ^2 (df)	p-value	Bonferroni-adjusted p	Cramér's V
Gender	Male	22 (13.7)	109 (67.7)	30 (18.6)	6.63 (2)	0.036	0.145	0.16
	Female	24 (23.1)	70 (67.3)	10 (9.6)				
Experience (years)	<5 years	42 (20.2)	138 (66.3)	28 (13.5)	7.08 (4)	0.132	0.526	0.12
	5-10 years	2 (5.4)	28 (75.7)	7 (18.9)				
	> 10 years	2 (10.0)	13 (65.0)	5 (25.0)				
Current role	Trainees	27 (26.0)	67 (64.4)	10 (9.6)	15.33 (6)	0.018	0.071	0.17
	Service doctors	7 (8.5)	56 (68.3)	19 (23.2)				
	Private practitioners	3 (11.5)	18 (69.2)	5 (19.2)				
	Faculty	9 (17.0)	38 (71.7)	6 (11.3)				
Sector	Government	31 (16.1)	131 (68.2)	30 (15.6)	0.77 (2)	0.681	1	0.05
	Private	15 (20.5)	48 (65.8)	10 (13.7)				

TABLE 7: Association between participant characteristics and need for teleguidance (N = 265) using Pearson's chi-square test

Row percentages. χ^2 (df): Pearson chi-square with degrees of freedom. Bonferroni-corrected significance threshold p < 0.0125 (four tests); no association was statistically significant after correction. "<5 years" combines the "<1", "1-2", and "3-5 years" categories of Table 1. Two cells in the experience and role tables had expected counts below 5; Monte Carlo permutation p-values were similar to the asymptotic values.

Preferred implementation: guide, platform, and specialty

Practitioners favored a known FMT expert (212, 80.0%) over a general senior doctor as the preferred source of guidance, while senior doctors and known practitioners experienced in medicolegal settings were secondary preferences (130-131, 49.1%-49.4% each). Combined communication methods (155, 58.5%) were preferred over any single platform, followed by voice calls (110, 41.5%) and WhatsApp/Signal or similar messaging software (94, 35.5%). Clinico-forensic toxicology (189, 71.3%), clinico-forensic traumatology (187, 70.6%), and forensic autopsy (143, 54.0%) were perceived as the specialties best suited to teleguidance, with report writing (223, 84.2%), framing opinion (194, 73.2%), and referral (120, 45.3%) cited as the leading purposes of consultation.

Implementation logistics: documentation, confidentiality, cost, and setup

For documentation of teleguidance by medicolegal experts, a combination of methods (75, 28.3%) was preferred over any single format, such as standardized forms (69, 26.0%) or detailed notes (53, 20.0%). Consent forms (167, 63.0%), encryption (140, 52.8%), and secure platforms (137, 51.7%) were the leading safeguards cited for confidentiality. Overall, 238 (89.8%) believed that secure platforms could facilitate access to patient records for MLC reporting; this reflects respondents' belief, not evidence of actual legal compliance. On cost, 112 (42.3%) anticipated reduced costs for both patients and professionals, while 74 (27.9%) were unsure; cost was not measured. An institutional-level medicolegal teleguidance unit was preferred (134, 50.6%) over a district-level unit (61, 23.0%).

Qualitative data analysis

Six major themes relevant to medicolegal teleguidance were derived from thematic analysis of the 25 interview transcripts.

Theme 1: Systemic Challenges in Documentation

Participants reported that documentation under high-pressure emergency conditions leads to inadequate histories and fragmented records. Surgeons and radiologists in particular cited difficulty in dating injuries, fractures, and hemorrhages, while laboratory-medicine participants struggled to correlate laboratory results with causation in clinico-legally significant cases. Participants attributed this to a lack of standardized protocols, poor chain-of-custody documentation, and insufficient medicolegal training.

Theme 2: Credibility Criteria for Forensic Experts

Participants regarded formal forensic qualifications (MD/DNB) as a baseline requirement. They also valued practical courtroom experience, familiarity with healthcare legislation, and a professional reputation built on impartiality and peer recognition.

Theme 3: Benefits and Limits of Real-Time Consultation

Participants felt teleguidance could help in the initial assessment of assault, road traffic accident, and poisoning cases, analogous to Tele-ICU, with video preferred for visualizing injuries. However, voice calls were the second most preferred method in the survey (41.5%), a divergence not fully resolved here. Platforms needed to be technically simple, compatible with hospital IT, and capable of secure image sharing. Experienced practitioners noted that in-person consultation remains necessary for complex or high-stakes cases, positioning teleguidance as complementary rather than a replacement.

Theme 4: Ethical and Legal Concerns

Participants prioritized robust (not absolute) protection of patient confidentiality, informed consent, and safeguards against conflicts of interest, noting the relevance of privacy-by-design, role-based access, encryption, audit trails, and applicable Indian data-protection law. Legal admissibility of remotely guided opinions under the BSA 2023 recurred as a concern, tempered by the Act's recognition of electronic and digital evidence, which participants felt offers a legislative opening for structured teleforensic documentation.

Theme 5: Infrastructural barriers

Reported barriers included the absence of a clear legal framework for teleforensic consultation, poor rural connectivity, and a pervasive fear of legal liability and cross-examination after the introduction of the BNS. Participants noted that many people seeking care in peripheral facilities have limited internet access, making rural reach a persistent constraint.

Theme 6: Training and Future Technology Integration

Participants suggested structured training on documentation, the new legal provisions, and digital platform use. Several expressed exploratory interest in AI-assisted injury pattern recognition, blockchain-based tamper-proof records, 3D reconstruction tools, and adding AI-based wound analysis and other medicolegal interpretation to such a unit's services. These applications are not yet validated for medicolegal use and are presented as practitioner suggestions, not study findings.

Table *8* presents the integrated, GRAMMS-aligned joint display of the quantitative and qualitative findings.

Research pillar	Quantitative result (N = 265)	Qualitative theme (n = 25)	Integrated meta-inference
Need for support	219 (82.6%) moderate-to-high composite need; 90 (34.0%) felt a lack of guidance while deposing in court	Documentation under pressure; lack of standardized protocols in emergency settings	Perceived need linked to pressure of real-time forensic documentation
Technological readiness	246 (92.8%) comfortable with technology; 238 (89.8%) want training	Preference for real-time video; voice calls separately second-preferred (41.5%), a noted divergence	Perceived readiness for digital tools, favoring higher-fidelity solutions
Barriers to entry	49 (18.5%) reported postponement for lack of guidance	Fear of legal cross-examination; uncertainty about admissibility of remote evidence	Hypothesis only: legal-liability concern and workforce shortage may jointly contribute to delay
Implementation preference	134 (50.6%) prefer institutional-level units; 212 (80.0%) prefer a known forensic medical expert	Requirement for credible, impartial expertise	Hub-and-spoke model is an author-proposed framework, not a directly measured item

TABLE 8: Integrated representation of medicolegal teleguidance readiness (GRAMMS-aligned joint display)

All quantitative results are self-reported perceptions.

GRAMMS: Good Reporting of A Mixed Methods Study.

Discussion

Need for teleguidance: contextual rationale

The moderate-to-high perceived need reported here is consistent with the structural shortage described earlier: 13,08,009 RMPs served by only 5,507 forensic specialists, with many peripheral health centers located far from the nearest autopsy center [8]. Service doctors reported numerically higher need, which may reflect their role as first responders in settings with limited specialist backup [1]. However, this association did not remain significant after correction for multiple comparisons and should be treated as hypothesis-generating.

Comparison with literature: knowledge gaps and teleguidance demand

A documented gap exists in Indian medicolegal training, with fewer than 50% of resident doctors knowing when to file an MLC, and interns and young medical officers often avoiding involvement in MLCs due to legal fears [16-18]. This study did not detect an association between experience category and need for real-time medicolegal guidance ($p = 0.132$); this should not be read as evidence of no difference, as the study was not powered for the comparison. One possible interpretation is a structural training gap rather than a temporary learning curve, since senior practitioners also reported difficulties in traumatology, toxicology, and medical documentation and certification, although selection, confounding, and measurement error cannot be excluded. In addition, 41% of Indians had not used the internet as of 2024, which constrains the reach of any digital model [24].

Legislative context and the teleguidance opportunity

Section 106(1) of the BNS provides that an RMP who causes death by a rash or negligent act while performing a medical procedure may be punished with imprisonment up to two years and a fine (Section 106(2), on fatal negligent driving with failure to report, was excluded from the 1 July 2024 commencement) [10]. The BSA's recognition of electronic and digital evidence opens a route for properly documented remote forensic opinions to carry evidentiary weight, though it does not itself establish blockchain-specific or remote-opinion admissibility [25]. Participants saw both admissibility concerns and an opportunity in this provision.

These opportunities come with substantial ethical and regulatory gaps. The Telemedicine Practice Guidelines (2020), now an appendix to the NMC professional conduct regulations, cover RMP-to-RMP consultation but do not address medico-legal consultation, the issuing of certificates after teleconsultation, or the evidentiary status of remotely guided opinions [26,27]. Dabhi et al. have shown how such ambiguity has allowed medical certificates to be issued on the basis of online self-report alone, with legal responsibility resting on the certifying RMP [26]. A medicolegal teleguidance service must not repeat this: any report or certificate must rest on the treating RMP's own physical examination, with the forensic expert in an advisory

role only. Further ethical requirements include informed consent for remote sharing of images and records, particularly for survivors of sexual offences and minors; confidentiality and data protection under the Digital Personal Data Protection Act, 2023; management of conflicts of interest and preservation of the impartiality expected of forensic experts; and equity of access where rural internet connectivity is limited [24]. A regulatory framework would need to define the scope of medicolegal teleguidance, standard operating procedures, secure and auditable platforms, record retention, indemnity, and licensure across state boundaries.

Global evidence and its Indian parallel

International forensic telehealth models such as TeleSANE and the SAFE-T Center have set a benchmark for feasibility and perceived evidence quality in remote areas (non-experimental pre-post evaluations without in-person controls; not evidence of superiority) [28,29]. A 2023 survey of Illinois hospital administrators similarly found that 95% perceived expanded telehealth opportunities in medical forensic evaluation [30]. A broadly similar preference for hybrid, real-time consultation was observed here. The Indian context differs, however. One option is integrating a medicolegal teleforensic unit with the national telemedicine backbone (eSanjeevani), bridging the gap to the digital medicolegal reporting system (MedLEaPR, adopted by 17 states, not yet a nationwide mandatory chain) [31]. Such integration requires governance, interoperability, and cost evaluation, and is proposed for future pilot testing, not as an empirical finding.

Rationale for teleguidance: from findings to framework

The findings locate perceived barriers to teleguidance in institutional and regulatory design. Preference for certified experts over generalist seniors reflects a demand for legal credibility; preference for institution-level over district- or national-level administration suggests a need for proximity. As an author-proposed model rather than a measured finding, these preferences suggest a hub-and-spoke structure anchored in FMT departments. In this model, the hub would act in an advisory capacity, with complex or high-stakes cases (e.g., sexual offences, deaths in custody, and disputed injuries) referred for in-person forensic examination. It would require alignment with the Telemedicine Practice Guidelines [27], the Digital Personal Data Protection Act, 2023, BNS/BNSS/BSA provisions on evidence authentication and chain of custody, licensure, indemnity, and record retention. Integration with MedLEaPR, implemented in 17 states rather than as a nationwide mandatory chain, could, if extended, route expert-guided outputs into the Ministry of Home Affairs' reporting chain [31].

Community and systemic implications

Beyond the individual practitioner, the documentation delays reported here occur against a backdrop of high judicial case pendency [6]. Whether teleguidance would improve documentation turnaround, reduce pendency, or improve judicial outcomes was not measured here and requires prospective evaluation of patient, report, workflow, and legal outcomes before any causal claim. Weaknesses include rural connectivity gaps, the physical limits of remote examination, data-privacy concerns, and legal complexity. A medicolegal teleconsultation initiative by forensic medical experts, supported by the National Forensic Infrastructure Enhancement Scheme (NFIES) of the Ministry of Home Affairs [32], could be evaluated as a component supporting law enforcement in India.

Medicolegal limitations of remote consultation

Remote consultation has inherent medicolegal limits. First, examination and documentation: injuries cannot be palpated, measured, or reliably aged over video, and image resolution, lighting, and lack of scale can distort assessment. Findings recorded in the MLC register, wound certificate, or post-mortem report must therefore come from the treating doctor's own examination. Second, evidence preservation: biological samples, trace evidence, and clothing must be collected, sealed, and handed over in person with an unbroken chain of custody. Images or recordings shared remotely are electronic records whose admissibility under the BSA 2023 depends on proof of integrity and certification (Sections 61 and 63) [25]. Informal messaging applications rarely provide audit trails, and storing images of victims on personal devices creates confidentiality risks. Third, professional accountability: under the Telemedicine Practice Guidelines, the RMP who seeks consultation remains responsible for treatment and recommendations [27]. In medicolegal work, the examining doctor signs the report and gives evidence in court, while the remote expert's input is advisory. How liability is shared, whether the remote expert can be summoned as an expert witness (BSA Section 39), and how indemnity applies all remain undefined. Teleguidance is therefore intended to support, not replace, the examining doctor. The treating RMP remains responsible for the physical examination, evidence collection, documentation, and medicolegal opinion, and remote advice should inform, not determine, that independent assessment.

Limitations of the study

Participants were recruited through convenience and referral sampling via online professional channels, which may have favored practitioners already engaged with digital platforms. The study was conducted in Tamil Nadu and Puducherry, with a larger share of government-sector practitioners and junior residents. Therefore, the findings reflect this setting and may be extended to other regions through broader, multi-

state studies. The achieved sample was smaller than planned, so subgroup comparisons should be viewed as exploratory. As the study captured practitioners' perceptions, the actual impact of teleguidance on medicolegal practice remains to be evaluated in future pilot studies. The composite need score was developed for this study and would benefit from further validation. The qualitative component drew on only a selected range of specialties, and independent coding by two authors was used to support the consistency of interpretation.

Conclusions

In this sample of medical practitioners from Tamil Nadu and Puducherry, a substantial majority reported a moderate-to-high perceived need for medicolegal teleguidance, alongside high self-reported technological readiness and willingness to adopt structured teleforensic consultation, particularly for report writing, injury interpretation, and clinico-forensic toxicology. These findings describe the surveyed sample and should not be generalized without a defined sampling frame. The legislative reforms of 2024 may heighten practitioners' perceived need; whether remotely guided documentation would be accepted as evidence under the BSA's provisions on electronic records remains untested.

Because this was a cross-sectional study of perceptions, it cannot show that teleguidance improves documentation, efficiency, or medicolegal or judicial outcomes. Medicolegal teleguidance should complement, not replace, direct clinical examination and independent medicolegal assessment by the treating doctor. The findings support further co-design and feasibility testing (staged user-centred design, legal and privacy assessment, and a prospective comparative pilot with prespecified outcomes) before any policy adoption, together with a follow-up study on best-practice guidelines and a regulatory framework. A medicolegal teleguidance unit piloted under the National Health Mission, with possible future collaboration across the Ministries of Health, Home Affairs and Law & Justice, could be evaluated for its effect on documentation quality and case-proceeding delays.

Appendices

Appendix A

Q. no.	Section	Question	Options/items
i.	Basic details	Name (mandatory) (as in NMC IMR registry)	
ii.		Email ID (mandatory)	
iii.		Contact no. (optional)	
iv.		Medical Council registration no. (mandatory)	
1	Demographic information	Age	
2		Gender	Male; Female; Third gender; Prefer not to say
3		What is your current role as a medical practitioner?	Casualty medical officer in any clinical establishment; Medical officer/consultant in PHCs/UHCs; Medical officer/consultant in CHCs; Medical officer/consultant in district hospitals/THCs; Medical officer/consultant in Govt/Private Medical College hospitals; Clinician in private practice/general practitioner; Senior resident; Junior resident
4		Sector that you are working in?	Central government; State government; Private sector; Both public and private sector; Running private clinic
5		State/region where you practice medicine in India at present	
6		Years of experience as a medical practitioner (after permanent registration with council)	
7		Site of practice	Rural; Urban; Semi-urban; Metropolitan

8		Specialty (if applicable) - broad specialty or super-specialty	Medical; Surgical; Para-clinical; Pre-clinical; Specify the specialty
1	Experience in medicolegal cases	How many years of experience do you have in managing medicolegal cases?	Less than a year; 1-2 years; 3-5 years; 5-10 years; >10 years
2		How often do you encounter medicolegal cases in your practice?	Never; Rarely (1-2 times a year); Occasionally (3-5 times a year); Frequently (6-10 times a year); Very frequently (more than 10 times a year)
3		What are the types of medicolegal cases you typically handle? Select all that apply	All cases of injuries and burns, the circumstances of which suggest commission of an offence by somebody (irrespective of suspicion of foul play); All vehicular, factory or other unnatural accident cases, especially when there is a likelihood of the patient's death or grievous hurt; Cases of suspected or evident sexual assault; Cases of suspected or evident criminal abortion; cases of unconsciousness where its cause is not natural or not clear; All cases of suspected or evident poisoning or intoxication; Cases referred from a court or otherwise for age estimation; Cases brought dead with improper history creating suspicion of an offence; Cases of suspected self-infliction of injuries or attempted suicide; any other case not falling under the above categories but with legal implications
4		Have you ever postponed MLC documentation or reporting waiting for proper guidance for a medicolegal case?	Yes; No; Maybe
5		How long does it take for you to reach a proper conclusion in handling an MLC?	Less than 24 hours; More than 24 hours
6	Need of medicolegal guidance	Have you ever felt the lack of proper medicolegal guidance while deposing/answering in a court of law?	Yes; No; Not deposed in court to date
7	Experience with teleconsultation	Have you ever used a teleconsultation platform for attending patients or for expert consultation from other specialties?	Yes; No
8	Need of medicolegal teleguidance	How often have you felt the need for teleguidance for medicolegal cases?	Rarely (1-2 times a year); Occasionally (3-5 times a year); Frequently (6-10 times a year); Very frequently (more than 10 times a year); Nil (never)
9		Do you believe teleguidance can help medical practitioners in efficient handling of medicolegal cases in India?	Strongly disagree; Disagree; Neutral; Agree; Strongly agree
10		Do you believe teleconsultation can improve the efficiency of preparing medicolegal reports?	Strongly disagree; Disagree; Neutral; Agree; Strongly agree
		Have you ever	

11		discussed the need for medicolegal teleguidance with your colleagues, seniors or administrators?	Yes; No; Maybe; If yes, whom did you approach?
12		According to you, which is more correct regarding medicolegal consultation?	In-person medicolegal consultation is better; Medicolegal teleguidance is better; Combination of both methods; To be decided on a case-to-case basis; Not required
13	Resource persons for medicolegal teleguidance	According to you, who will be helpful for guiding you to handle medicolegal cases effectively? Select all that apply	Colleagues; Senior doctors; Known forensic medical expert; Known practitioner with experience in medicolegal settings; Lawyers irrespective of specialization; Lawyers specialized in medicolegal cases
14	Modes & resources of medicolegal teleguidance	What is the platform you prefer for medicolegal teleguidance?	Voice call; Video communication; WhatsApp/Signal/messaging software communication; Mail communication; Combined methods
15		What are the resources, according to you, helpful/assisting in handling medicolegal cases?	Google search; WhatsApp messages; Institutional forums; Government websites; Open-resource websites/e-platform (specify)
16	Domains of medicolegal teleguidance	In which medicolegal specialties could teleguidance be most beneficial?	Forensic autopsy (post-mortem cases); Clinico-forensic traumatology (trauma/sexual offence cases); Clinico-forensic toxicology (poison/drugs/alcohol cases); Identification and certification; Other (please specify)
17	Item/stage specification for medicolegal teleguidance	What will be the purpose of consultation with regard to teleguidance in medicolegal cases? Select all that apply	Report writing; Referral; History taking; Framing opinion; Follow-up; Others (please specify)
18	Documentation of medicolegal teleguidance	How would you like to document medicolegal teleguidance, if legally admissible?	Prefer not to document; Detailed notes; Audio recordings; Standardized forms; Other (please specify)
19	Legal & ethical implications/considerations	How shall patient confidentiality be ensured in medicolegal teleguidance?	Encryption; Consent forms; Secure platforms; Other (please specify)
20		Do you believe secure teleconsultation platforms could facilitate access to patient medical records for assisting in medico-legal report writing?	Yes; No
21		What impact could teleguidance have on the overall cost of handling medicolegal cases?	Decreases costs; Increases costs; No significant impact; Unsure
22	Strengths and	Do you believe teleconsultation can enhance collaboration between medical	Yes; No; Unsure

	opportunities	practitioners/specialists of other disciplines and medicolegal experts?	
23		Are you comfortable with using technology for teleconsultation purposes?	Yes; No
24	Training for medicolegal teleguidance	Would you be interested in receiving training on how to effectively utilise teleconsultation for medicolegal purposes?	Yes; No
25	Future considerations of medicolegal teleguidance	According to you, what is the preferable level of administration for setting up a medicolegal teleguidance unit to meet the needs of medicolegal case handling in India?	Institutional level; Zonal level; District level; Regional level; State level; National level; Not interested

TABLE 9: Questionnaire for the quantitative survey

Appendix B

Interview Guide: Qualitative Survey

Introduction: Thank the participant for their time. Record name, age, sex, Medical Council registration number, e-mail ID, and contact number of the participant. Briefly explain the purpose of the interview, emphasizing that their insights will contribute to understanding the feasibility and potential of medicolegal teleguidance. Assure confidentiality and seek consent to record the interview.

1. Experience in medicolegal cases (5 minutes)

Kindly share the challenges you face in preparing accurate medicolegal reports. (Probe for specific issues related to data gathering, examination limitations, etc.)

2. Resource persons for medicolegal teleguidance (5 minutes)

Kindly mention your criteria to assess the credibility and expertise of a medicolegal expert. (Suggestions: credentials, reputation, case experience, others)

3. Modes and resources of medicolegal teleguidance (5 minutes)

Kindly share the reasons for your preferred modes/platforms of medicolegal teleguidance. (Suggestions: clarity, saves time, requires less technical knowledge, compliant with networks and technological support at the workplace, others)

4. Item/stage specification for medicolegal teleguidance (5 minutes)

Kindly share, from your perspective, the common areas or domains of medicolegal management where teleconsultation with a forensic medical expert could be most helpful in the Indian context. (Suggestions: initial assessment of the patient/victim, reviewing medical records, discussing differential diagnoses specific to the Indian context (e.g., snake bites, dowry deaths), determining cause of death or injury, preparing a medicolegal report according to Indian legal guidelines)

5. Factors/criteria for seeking medicolegal teleguidance (5 minutes)

Kindly share the factors that influence your decision to seek teleguidance versus traditional in-person consultation for medicolegal cases. (Suggestions - teleguidance: convenience, cost-effectiveness, time

efficiency, quality of advice, other; in-person consultation: clarity, prompt corrections, confidence, satisfaction)

6. Legal and ethical implications/considerations (5 minutes)

Kindly share your ethical and legal considerations when seeking medicolegal advice remotely via teleconsultation. (Suggestions: informed consent, conflicts of interest, privacy, others)

7. Challenges and limitations in medicolegal teleguidance (5 minutes)

Kindly share your thoughts about the biggest challenges to teleguidance for medicolegal purposes in terms of the legal framework and medical landscape in India.

8. Training for medicolegal teleguidance (5 minutes)

Kindly suggest training skills or educational resources that would enhance your ability to handle medicolegal cases effectively via teleconsultation. (Suggestions: legal aspects, technical skills, communication skills, others)

9. Future considerations of medicolegal teleguidance (5 minutes)

Imagine a teleconsultation platform designed specifically for medicolegal consultations. Kindly suggest a basic structure and requisites of a medicolegal teleguidance unit for any level of administration. (Give the example of TeleSANE in Pennsylvania. Suggestions: building, site, manpower, materials, secure data transmission/data privacy, integration with electronic health records/HMIS, medico-legal expert availability, real-time chat functionality, multi-language compliance)

10. Future considerations of medicolegal teleguidance (5 minutes)

What emerging technologies (e.g., AI, VR) do you think could play a role in the future of teleconsultation for medicolegal cases?

Closing (5 minutes): Thank the participant for their valuable insights. Offer the opportunity to ask any questions they may have about the study.

Additional considerations: Encourage the participant to elaborate on their responses and provide specific examples where possible. Maintain a respectful and professional demeanour throughout the interview. Ensure the interview is conducted in a private and confidential setting. Record the interview with the participant's consent for later analysis.

Additional Information

Author Contributions

All authors have reviewed the final version to be published and agreed to be accountable for all aspects of the work.

Concept and design: Mukesh R, Amaravathi Uthayakumar, Gautam Roy, Ambika Prasad Patra

Acquisition, analysis, or interpretation of data: Mukesh R, Amaravathi Uthayakumar, Kumaran M

Drafting of the manuscript: Mukesh R, Amaravathi Uthayakumar

Critical review of the manuscript for important intellectual content: Mukesh R, Amaravathi Uthayakumar, Gautam Roy, Kumaran M, Ambika Prasad Patra

Supervision: Gautam Roy, Kumaran M, Ambika Prasad Patra

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