Journal of Forensic and Legal Medicine 116 (2025) 102976

Contents lists available at ScienceDirect

Journal of Forensic and Legal Medicine

journal homepage: www.elsevier.com/locate/yjflm

Research Paper

Public prosecutors' perspectives on forensic medical information in non-fatal injury cases in the Netherlands: practices, barriers and recommendations

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ARTICLE INFO

Keywords:
Physical injury
Public prosecution
Forensic doctor
Criminal law
Forensic medical examination
Forensic medical injury report

ABSTRACT

Public prosecutors in the Netherlands play a crucial role in ensuring that criminal cases are supported by evidence. This study surveyed public prosecutors to examine current practices, barriers, and recommendations related to the use and availability of forensic medical reports in cases involving non-fatal injuries, including the use of injury dating.

Twelve prosecutors with specific injury-related expertise from 8 out of the 10 police regions completed the online survey. Medical information was viewed as contributing to criminal law proceedings. Forensic medical information was considered particularly important in serious cases such as severe abuse, attempted manslaughter, sexual assault, and domestic violence. Information from treating physicians specifically in cases involving permanent injuries or repeated incidents, especially in the context of domestic violence. However, use of the latter was often limited by concerns about quality, completeness, and accessibility.

Key barriers included time constraints, a shortage of forensic doctors, unclear procedures within the police, privacy concerns among treating physicians, and limited awareness among prosecutors. To address these issues, prosecutors emphasized the need for improved training, the appointment of specialized personnel, stronger interdisciplinary collaboration, and the development of clear procedural guidelines.

In conclusion, this study offers concrete recommendations to enhance the integration of forensic medical expertise into criminal proceedings, contributing to a more effective, efficient, and equitable judicial process.

1. Introduction

In the Dutch criminal justice system, public prosecutors play a central role in managing investigations and preparing cases for court. Operating within an inquisitorial system, they collaborate closely with police and investigative judges, bearing responsibility for overseeing evidence collection, ensuring that case files are comprehensive and coherent, and requesting expert input when needed.[1]

In this inquisitorial system, written evidence forms the cornerstone of legal proceedings, as trials primarily rely on documented witness

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https://doi.org/10.1016/j.jflm.2025.102976
Received 25 June 2025; Received in revised form 29 August 2025; Accepted 20 September 2025
Available online 24 September 2025

statements, investigation reports, and expert opinions, with limited oral testimony. This approach contrasts with the adversarial system, used in countries such as the United Kingdom and the United States, where oral testimony—particularly from expert witnesses—plays a central role in court proceedings. Despite European case law advocating for greater "immediacy" in court proceedings—emphasizing the value of direct, in-court witness testimony— in the Dutch inquisitorial model, witnesses are rarely summoned to testify, as their written statements are generally deemed sufficient.[1,2]

Physical injuries often serve as critical evidence in criminal cases, particularly in instances of assault and domestic violence. Based on the circa 22,000 abuse-related cases and the 4250 court cases the public prosecution handled in 2023, it can be inferred, assuming an even distribution, that the 1087 prosecutors and attorneys general on average dealt with about 20 abuse cases, with around 4 advancing to court.[3–5] These figures underscore how frequently prosecutors are confronted with injury as a key element in case assessment and legal qualification. In addition to abuse, other offenses such as traffic-related crimes may also induce physical injury in the involved victims as well as suspects. In the Netherlands, public prosecutors may specialize in specific areas such as forensic evidence, medical cases, sexual offenses, and domestic abuse. These specializations typically involve a particular high incidence of cases with physical injury.

Injury-related information to support effective prosecution may be provided by different stakeholders. Forensic doctors play a key role by providing independent expert interpretations of injuries. Their work includes conducting clinical forensic medical examinations or providing analyses based on photographs and medical records. Their reports range from basic injury descriptions and the translation of medical information into accessible language for legal purposes, to comprehensive expert reports on specific legal questions. For such expert reports formal appointment as a court expert is required and may address issues such as causality, severity or the dating of injuries.[6] Furthermore, treating physicians when providing medical care, document injuries in medical records and may be asked to complete standardized legal forms describing the injury and treatment. It is not permissible for treating physicians to provide interpretations, since they are not independent and generally lack the required forensic expertise.[7–9] Additionally, police officers may document injuries during investigations, either through written descriptions or photographs taken by regular police or by forensic specialists. Furthermore, victims often provide statements and photographic evidence to supplement the case file.

Analysis of case files and court rulings from Amsterdam revealed that forensic medical reports were often absent in cases involving physical injury, appearing in only 10 % of cases, while 25 % included documentation from a treating physician.[10,11] Interviews with the judiciary highlighted that, although admissible, documentation from treating physicians, police, and victims often lacked evidentiary value due to concerns over quality and a lack of objectivity. In the absence of forensic reports, judges frequently interpreted injury or medical documentation themselves, avoiding expert consultation to prevent delays.[10,11]

This study forms part of broader efforts to strengthen the field of forensic medicine in the Netherlands and to inform future implementation of injury dating methods currently under investigation.[12] It explores public prosecutors' perspectives on the use of medical information in cases involving non-fatal physical injuries, with a focus on current practices, barriers to accessing forensic expertise, and opportunities for improvement. In addition, it examines current methods for dating injuries and identifies where procedural improvements may be needed. By capturing the experiences and recommendations of prosecutors, the study aims to support better integration of forensic medical information into criminal proceedings and to support equitable access to justice for victims of violent crime.

2. Research methods

2.1. Study design and data collection

A cross-sectional, regional-level survey was developed in Dutch using SurveyMonkey. The survey targeted public prosecutors across the Netherlands, who frequently handle cases involving physical injury, including those specializing in forensic evidence, medical cases, sexual violence, domestic violence, and child abuse.

The survey was distributed on July 14, 2022, to public prosecutors nationwide who met the specified criteria. Respondents were asked to complete the survey based on their experiences with non-fatal physical injury cases in the past year, and not to include their experiences with sexual assault offenses. The survey remained open until September 26, 2022. Two partially completed questionnaires (due to technical difficulties) were finalized through telephone interviews.

2.2. Development of the survey

The survey was developed and tested collaboratively by practicing forensic doctors with experience in injury reporting, a public prosecutor, and researchers for methodological input.

The survey included both open-ended questions and items rated on a 5-point Likert scale. For clarity, the 5-point scale responses are summarized into three broader categories in the results section.

The following key topics were included: (1) Respondent characteristics, (2) Current practices, (3) Requests for medical information on injuries, (4) Barriers & recommendations and (5) Injury dating (see appendix A).

2.3. Data-analysis

Qualitative responses were analysed using thematic coding techniques with MAXQDA Plus (2022) software, following the six-step framework outlined by Rädiker and Kuckartz (2020).[13] Quantitative data from Likert-scale responses were analysed descriptively to identify trends and patterns.

3. Results

3.1. Respondent characteristics

3.1.1. Expertise and jurisdiction

A total of 12 public prosecutors participated in the questionnaire, representing 8 of the 10 prosecutorial jurisdictions in the Netherlands, which correspond to the 10 police regions. Despite efforts to engage all jurisdictions, two regions (P06 The Hague and P10 Limburg) did not have any participating respondents. Each of the 8 responding regions had between 1 and 3 respondents. Their area(s) of expertise included: forensic (6), domestic and child abuse (5), sexual offenses (4), and medical cases (3). Fig. 1 presents the distribution of responses across the police regions and the geographical spread of these regions (P01–P10).

3.1.2. Experience, training and competence

The respondents had an average of 13 years of relevant work experience (range: 6–24 years). Other previous judicial experience included: lawyer (n = 3), prosecution secretary (n = 2), legal officer (n = 4). All respondents frequently encountered criminal cases involving injury in the past year (42 % very often and 58 % often).

Five public prosecutors reported having received specific training in interpreting (forensic) medical information about physical injury. One respondent specifically mentioned that training was organized by the Expertise Centre for Medical Cases (*EMZ*).

Two-thirds (67 %) of respondents reported feeling competent in interpreting medical information. Half of these had received specific training. Those who had not received formal training mentioned that the

Police region	Number of respondents
P01 Northern Netherlands	1
P02 Eastern Netherlands	2
P03 Central Netherlands	1
P04 North Holland	1
P05 Amsterdam	2
P06 The Hague	0
P07 Rotterdam	1
P08 Zeeland - West Brabant	1
P09 East Brabant	3
P10 Limburg	0

Fig. 1. Police regions in the Netherlands & number of respondents. The map is displaying the police regions (P01-P10) - outlined in blue. The names of the identifiers as well as the number of respondents per police region are provided in the figure.[h1].

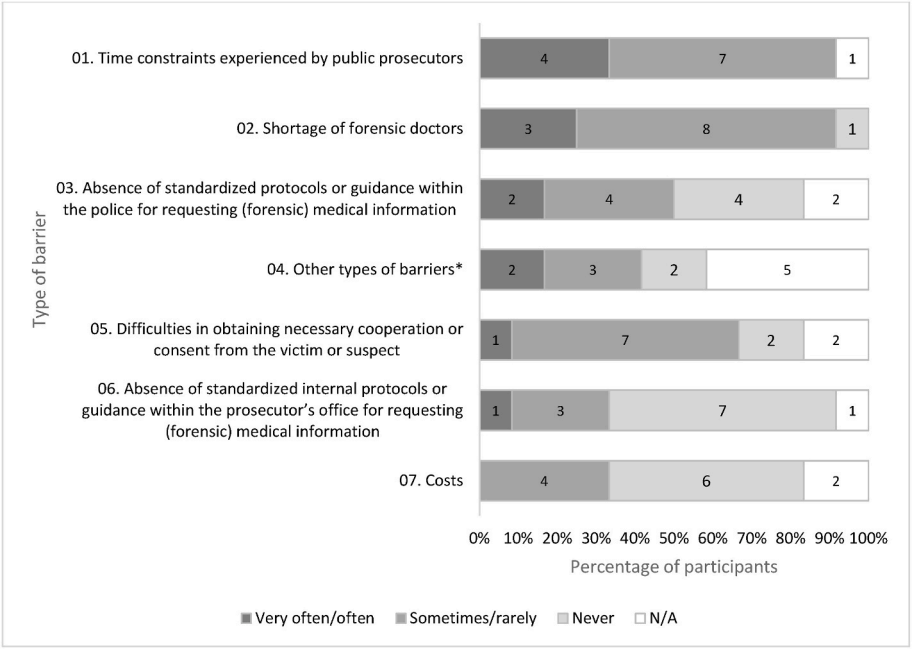

Fig. 2. Barriers to obtaining (forensic) medical information. This figure presents the percentage of respondents reporting various barriers to obtaining medical information from both forensic doctors and treating physicians. Barriers are listed from most to least frequently mentioned. The bars show how often each barrier was encountered (very often/often, sometimes/rarely, never, or not applicable), with the number of respondents indicated within each section. *Other types of barriers mentioned included the refusal of treating physicians to provide data, even in cases where parental consent or a court order was available; a lack of knowledge among prosecutors about the possibility of involving a forensic doctor (reported twice); and a shortage of NFI experts for child abuse cases (reported twice).

regular training for the judiciary and prosecution, provided by the Legal Administration Study Centre (*SSR*), was sufficient to cover this topic or indicated that they had developed their competence primarily through hands-on experience and frequent exposure to medical reports.

"Considering the SSR courses I followed, including medical terminology, I feel more competent."

"After reading many reports and explanations, I can now reasonably understand them."

Conversely, 33 % of respondents, including one with specific training, stated they did not feel sufficiently competent. These respondents acknowledged their limitations in interpreting medical information and relied on external expertise:

"I am not competent in interpreting medical information myself. When I receive an injury interpretation from a doctor, I can determine its relevance to my case, but medical reports often contain many terms that are difficult to interpret without medical training. In such cases, additional input from a doctor is necessary."

3.2. Current practices

3.2.1. Availability of medical information

Public prosecutors were asked how frequently medical information on physical injury—originating from forensic doctors, treating physicians, or other medical professionals—was available in criminal cases over the past year.

The availability of medical information was similar for forensic doctors and treating physicians: very often/often (n = 6) and sometimes/rarely (n = 6). In contrast, information from other medical professionals was less common: sometimes/rarely (n = 8) and never (n = 4). Professionals mentioned in this category included physiotherapists, occupational health doctors, experts from the Netherlands Forensic Institute (NFI), the PTSD Trauma Centre Netherlands, and doctors at Safe Home.

Medical information was most often available in cases involving more serious indictments, such as attempted manslaughter or murder, severe abuse, abuse resulting in grievous bodily harm, child abuse, and domestic violence. By contrast, such information was less frequently present in less serious offenses, such as public violence, simple assault, robbery, and theft. One respondent noted that particularly in traffic cases, injury assessments are often absent.

Most respondents indicated that medical information was often (n = 2, region P03 Central Netherlands and P05 Amsterdam) or sometimes (n = 6) missing in cases where it could have been relevant. A smaller number reported this occurred rarely (n = 3) or never (n = 1: region P01 Northern Netherlands), with the latter specifically noting to actively seek medical documentation when necessary.

As one public prosecutor explained:

"I just see that there are very few forensic medical expert reports, and when I think about how many criminal cases we have involving injury, I think: 'that can't be right'. It is seldom that the suspect has the exact same story about the injury as the victim and then you still want to be able to ask questions and clarify whether what the victim says is correct - could that injury indeed have been inflicted in that way or is it different? And of course, you need a forensic doctor for that".

3.3. Requests of medical information on injuries

3.3.1. Role of the public prosecutor

Public prosecutors were asked who holds responsibility for requesting and providing medical information on physical injuries in criminal cases. The majority of respondents (n = 8) indicated that this responsibility lies with the prosecutor, citing their role as lead investigator and their expertise in determining which information is necessary for the case file. Three respondents believed the primary responsibility rests with the police but noted that the prosecutor remains ultimately accountable for ensuring the availability of medical information by initiating document requests or appointing experts when required.

3.3.2. Requests of medical information

When asked about the frequency of requesting information from forensic doctors and treating physicians, responses varied. All respondents reported requesting such information at least occasionally. Information from a forensic doctor was requested often (6), sometimes (2) or rarely (4) and from a treating physician very often (3), often (1), sometimes (5) or rarely (3).

Reports from forensic doctors were preferred in the more serious indictments, for their detailed descriptions of injuries, which helped determine the severity, potential fatality, and the injury mechanism across various scenarios, but also for the recognition and validation they can provide to victims. Examples of such cases included: child abuse, domestic violence, sexual assault, severe abuse, attempted manslaughter/murder, and gunshot or stabbing incidents.

Respondents shared the following reflections about forensic medical information:

"I almost always ask a forensic doctor for information because they are faster, clearer, and provide expert knowledge."

"This information can be of particular importance for interpreting the severity of the injury and for answering whether an action could have been potentially fatal."

"If there is a difference of opinion between the suspect and victim(…), I will request it".

"Forensic injury reports are more often seen in cases of the more serious indictments. (…) for victims it often provides recognition of their injury".

Information from treating physicians was typically requested when only a description of the injury type and treatment was needed, without requiring interpretation. This applied in contexts involving repeated incidents, prolonged treatment, or complex injuries—such as domestic abuse or situations involving permanent injury. Problems with the quality of treating physicians' documentation were noted, including reports being too brief and lacking detail or photographs of injuries. Also the burden on victims of extra investigations was taken into account, as one prosecutor noted their contribution as follows:

"Especially in child abuse cases. Those physicians have all the needed information for the case and may also be able to provide a history of previous injuries, consultations, or concerns. In addition, this also applies to cases of serious violence where someone is in a rehabilitation process, you do not want to burden that victim again with a medical examination and, therefore, ask the treating physician for information".

3.4. Barriers & recommendations

3.4.1. Barriers

Respondents identified several barriers to obtaining medical information from both forensic doctors and treating physicians, with responses varying across individuals (see Fig. 2). The most frequently reported obstacles included limited time, a shortage of forensic doctors, the absence of clear procedures within the police and other reasons. In contrast, lack of patient consent, no clear procedure at the public prosecutor's office or associated costs were seldom considered significant barriers.

Two respondents elaborated on the specific challenges associated with the shortage of forensic doctors, emphasizing the lack of NFI experts for child abuse cases. This shortage was said to result in long waiting times and necessitate referrals to regional forensic doctors. It was also noted that the number of regional forensic doctors qualified to handle such cases is very limited, and uncertainty was expressed about whether they are sufficiently equipped to manage these cases.

The other barriers mentioned, raised both in response to this

[h] The map is created with QGIS - version 2.8.1 – Wien.

question and in open comments elsewhere in the survey, were privacy concerns expressed by treating physicians (reported by five respondents) and a lack of knowledge regarding the role and possibilities of forensic doctors (reported by four respondents). One respondent noted that the latter issue occurred despite the existence of a clear procedure and was attributed to frequent staff turnover, which contributed to unfamiliarity with relevant protocols and procedures.

Several respondents elaborated on these challenges:

"I think that at our public prosecution's office there is still too little awareness amongst police officers and public prosecutors about what they can do, and that it is smart to make use of the possibilities a forensic doctor has to offer"

"A treating physician who, despite parental consent or court order, did not wish to provide any information".

3.4.2. Recommendations

An open-ended question was posed to public prosecutors regarding recommendations for improving procedures for requesting (forensic) medical information. The responses were grouped according to the different disciplines: the police and public prosecution office, treating physicians, forensic medical services, as well as interdisciplinary cooperation.

3.4.2.1. Police and public prosecution office. Increase awareness and institutional knowledge about the use and value of forensic medical information:

- Organize meetings and case presentations to raise awareness of forensic medical possibilities.
- Integrate periodic training on forensic methods into existing professional development programs.

"I think the SSR should definitely do something about this regarding their training."

- Appoint a designated staff member within each public prosecutor's office to specialize in injury-related medical information.
- Enhance the police force's understanding of forensic medical practices.

3.4.2.2. Treating physicians. Education and improve cooperation with treating physicians:

- Promote compliance with medical information requests by educating hospital staff and treating physicians on the relevance of medical documentation in criminal proceedings, while respecting privacy regulations.
- Encourage collaboration between forensic and treating physicians, as information may be more readily shared between medical professionals.

3.4.2.3. Forensic doctors. Increase capacity and improve procedural clarity:

- Expand the number of trained forensic doctors and consider outsourcing routine tasks (e.g., blood draws) to reduce workload.
- Provide targeted information to stakeholders, for example through presentations or concise explanatory materials.

"A fact sheet about injury interpretations and the use of this type of information would be helpful."

- Streamline procedures for requesting forensic input, such as implementing a centralized contact system (e.g. a shared email address).

3.4.2.4. Interdisciplinary cooperation. Promote better communication and shared understanding across organizations:

- Establishing regular meetings between police, public prosecutors, and forensic doctors to discuss cases and present relevant information, thereby improving collaboration and the quality of case handling.

3.5. Injury dating

Respondents varied in how often they encountered uncertainty about the timing of injuries: often (n = 3), sometimes (n = 7), and rarely (n = 2).

A range of information sources was used to estimate the timing of injuries, with victim statements, photographs, witness and suspect statements, emergency notifications, and police reports cited most frequently. Reports from forensic doctors — who may be asked to answer specific questions about injury dating — or documentation from treating physicians describing the injuries and treatment were among the least commonly used sources (see Fig. 3). One respondent noted that the procedures for 112 reports are complicated. Other types of evidence mentioned included digital data carriers, such as smartwatches.

Several prosecutors questioned the evidentiary value of medical reports in this context. As one respondent noted:

"The reports of forensic physicians often give a rough estimation with regard to the dating of hematomas, which is often very difficult already. Statements from victims, suspects, or witnesses are needed to provide more context for this estimation from the forensic physician. The evidential value is not yet very high in these types of reports".

Injury dating was considered particularly relevant in cases involving child abuse, domestic violence, sexual offenses, and serious indictments, such as attempted manslaughter and severe abuse. It was seen as less critical in cases involving robbery, theft, traffic-related offenses, or public violence.

4. Discussion

This study contributes to ongoing national efforts to strengthen forensic medicine in the Netherlands, with a particular focus on improving the availability and use of forensic medical information in criminal cases involving non-fatal injuries, including injury dating methods.[12,14] It builds upon prior research showing that forensic medical reports are frequently absent, despite their recognized importance.[10,11] By examining the perspectives of public prosecutors, this study identifies key challenges in accessing and utilising forensic medical information and offers practical recommendations for improvement in the inquisitorial justice system.

While most prosecutors felt competent in interpreting medical information due to their training and professional experience, some noted gaps in their understanding, often relying on colleagues or external resources for support. To address this, respondents recommended more specialized training in medical-legal interpretation and closer interdisciplinary collaboration. These findings align with earlier Swiss research, where legal professionals similarly reported difficulties with complex medical terminology and inconsistent report quality, leading to calls for enhanced training and cooperation.[15] Future research could investigate whether regular case discussions or interdisciplinary case reviews between prosecutors and medical practitioners improve communication and mutual understanding—such exchanges are generally not practiced at present. Additionally, respondents advocated for appointing specialized staff within prosecution offices to improve the assessment and

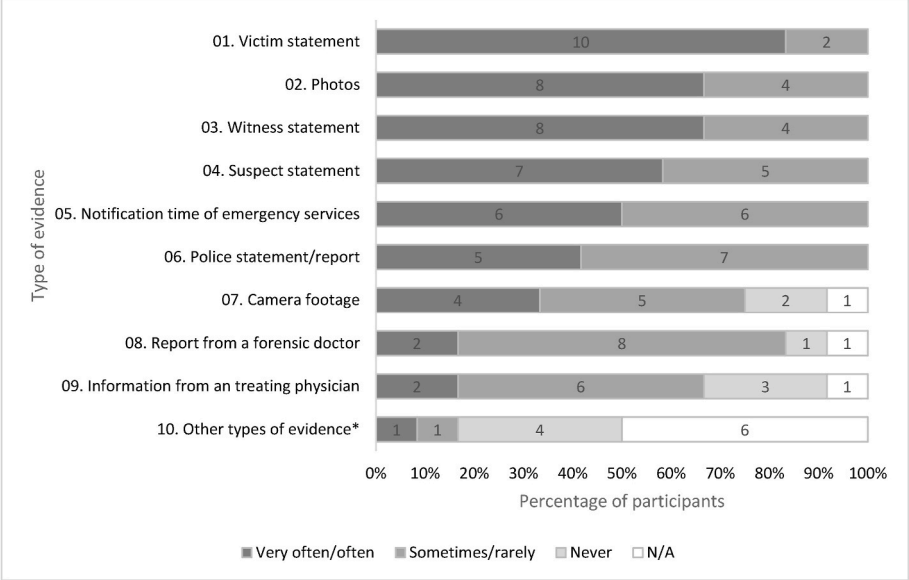

Fig. 3. Types of evidence used for dating of injury. This figure presents the percentage of respondents indicating how often different types of evidence are used to estimate the timing of injuries. The types of evidence are listed in order of how frequently they were used. The bars represent the frequency of use (very often/often, sometimes/rarely, never, or not applicable), with the number of respondents indicated within each section. *Other types of evidence mentioned included digital data carriers, for example smartwatches.

coordination of medical evidence. This aligns with the emerging role of forensic advisors in Dutch courts, who help bridge the gap between legal and scientific expertise.[16] Such specialized roles could similarly support prosecutors' understanding of (forensic) medical information and in addition help address time constraints, which was identified as a barrier.

Prosecutors broadly agreed on the importance of medical information in serious cases, such as those involving severe abuse, attempted manslaughter, domestic and sexual violence. However, they noted that medical reports were regularly unavailable, even when considered necessary. Only one respondent indicated consistently obtaining the needed medical information, suggesting that proactive practices in requesting reports may be useful practice. The issue of inconsistent access to forensic medical evidence is not new. In 2018, the Public Prosecution Service called for improvements in forensic medical practices, especially in cases involving child abuse, domestic violence, and sexual offenses.[17]

Documentation from treating physicians was seen as important, however concerns were also raised about its quality; being brief, difficult to interpret and lacking photographs. Judges have expressed similar concerns in previous studies.[11] Privacy concerns also emerged as a significant obstacle, with physicians hesitant to share information—even when legally permissible (by consent or court order)—highlighting broader challenges in collaboration between medical and legal professionals. Respondents suggested that training for treating physicians should be improved to enhance the quality and accessibility of medical documentation. Currently, training in forensic medicine is limited for treating physicians, and several studies have emphasized the need for improved training, both in the Netherlands and more broadly in Europe.[18–20]

The need for standardised protocols for accessing forensic medical information was a widely shared recommendation among respondents. Currently, protocols for adult non-fatal injury cases are not clearly defined, in contrast to other types of forensic medical assessments. For example, non-natural death investigations are subject to legal regulation.[21] Furthermore, the national network of Sexual Assault Centres has demonstrated the benefits of standardized approaches for victims of sexual violence, effectively addressing previously fragmented and inconsistent services.[22,23] The Public Prosecution Service's directive on domestic violence and child abuse provides some guidance on injury examination, emphasizing the importance of forensic injury documentation; however, it is not further elaborated or operationalized.[24] In recent years, structured guidelines have been developed for child abuse investigations.[25,26] However, comparable frameworks are still lacking for adult domestic violence cases—such as (ex-)partner violence—and for other cases involving non-fatal injury. Ongoing research is currently examining police procedures related to injury assessment, with the aim of informing future processes.[27] Furthermore, more professionalized protocols for forensic medical examinations and reporting are currently in development.[28] These efforts aim to create clearer pathways and enhance the quality and consistency of forensic medical practices. However, sustained attention and continued investment will be necessary to ensure lasting improvements.

Prosecutors also highlighted the need to consider victims' perspectives when requesting medical examinations, noting that such procedures can be burdensome. However, little is known about how victims perceive and experience procedures related to the documentation of physical injuries. While such examinations may be time-consuming or even stress-full, they may also offer validation and recognition of endured violence—an essential component of a trauma-sensitive approach in both criminal cases as well as family law proceedings.[29,30] There is growing awareness of the necessity for more trauma-sensitive approaches in the Dutch justice system.[29,30] Further research is needed to better understand victims' perspectives and ensure that investigations are thorough, equitable, trauma-informed and aligned with the EU Victims' Rights Directive and with the Istanbul Convention.[31–34]

Workforce shortages among forensic doctors were cited as a significant barrier to forensic medical evidence collection. Multiple policy reports in recent years have highlighted that workforce shortages impact service availability and quality.[35,36] Prosecutors reported the need to expand forensic doctor capacity, through workforce expansion and redistribution of tasks, such as outsourcing basic procedures like blood draws. These suggestions align with current national initiatives, including recruitment campaigns, enhanced training programs, and research aimed at task-shifting.[37–39]

Prosecutors expressed cautious attitudes toward using medical reports for injury dating, citing a lack of validated methods and limited evidentiary value. This reflects the current limited role of forensic

medical dating in criminal proceedings, though scientific advancements may improve its reliability in the future.

4.1. Strengths and limitations

A key strength of this study is its direct engagement with prosecutors from eight of the ten prosecutorial jurisdictions in the Netherlands. All participants specialized in handling injury-related cases and had an average of 13 years of professional experience. This targeted sampling provided well-informed perspectives, enhancing the depth and relevance of the findings.

However, the study has several limitations. The targeted selection approach may have introduced selection bias by overrepresenting prosecutors with a particular interest in forensic medicine. The sample size was relatively small (n = 12), and two jurisdictions did not participate, which may limit the generalisability of the findings. Additionally, some respondents found the 5-point Likert scale restrictive for expressing nuanced perspectives. However, open-ended questions helped mitigate this constraint by allowing rich qualitative insights, as reflected in the direct respondent quotations.

4.2. Conclusion

This study offers new insights into prosecutors' perspectives on medical evidence in cases of non-fatal injury. According to their views, several barriers hinder the effective use of (forensic) medical expertise in the Dutch criminal justice system. Improvements could be achieved by standardizing protocols, clarifying legal frameworks, expanding forensic capacity, providing targeted training, appointing specialized personnel, and strengthening interdisciplinary collaboration. Implementing these measures would support the development of more equitable, consistent, and efficient procedures for incorporating medical expertise into legal proceedings.

Ethics

This study was conducted in accordance with the ethical principles outlined in the Declaration of Helsinki. All participants provided informed consent prior to participation in the survey, ensuring their voluntary involvement and confidentiality. Collected data were anonymized to protect the privacy and rights of the respondents.

This study involved a voluntary survey of public prosecutors and did not involve the collection of sensitive personal data or biological material. In accordance with the guidelines of the Public Health Service of Amsterdam (GGD Amsterdam), Amsterdam UMC and national regulations, approval from an Institutional Review Board (IRB) or Ethics Committee was not required.

Data statement

The survey questions used in this study are available in the Appendix. The raw data are not publicly available due to confidentiality and privacy restrictions.

Author contributions (CRediT)

Abbreviations: Maartje L. Goudswaard: MG, Joyce N. Cuijpers: JC, Manon Ceelen: MC, Solange M. Hoogerheide: SH, Udo J.L. Reijnders: UR, H. Ibrahim Korkmaz: IK, Dionne S. Kringos: DK.

- Conceptualization: All authors
- Methodology: JC, MG, MC, UR, SH
- Material Preparation: JC, MG
- Data Collection: JC, MG
- Formal Analysis: JC, MG
- Supervision: MC, UR, IK, DK
- Writing – Original Draft Preparation: MG
- Writing – Review & Editing: All authors
- Approval of Final Manuscript: All authors

Author declaration

All authors have read and approved the final version of the manuscript and agree to its submission.

Funding source

This work received partial financial support from ZonMw as part of the project titled 'Dating of injury with new markers in superficial skin biopsies'. Project number: 10480012110003. The funder had no role in the design of the study, data collection, analysis, interpretation, or the decision to submit the manuscript for publication.

Declaration of competing interest

All authors certify that they have no affiliations with or involvement in any organization or entity with any financial interest or non-financial interest in the subject matter or materials discussed in this manuscript.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.jflm.2025.102976.

References

1. Komter ML, Malsch M. *The Language of criminal trials in an inquisitorial system: the case of The Netherlands. The Oxford Handbook of Language and Law*. Oxford University Press; 2012:408–420.
2. Groenhuijsen MS, Selçuk H. The principle of immediacy in Dutch criminal procedure in the perspective of European human rights law. *Z Gesamte Strafr*. 2014;126(1).
3. Centraal Bureau voor de Statistiek (CBS). Geregistreerde criminaliteit; soort misdrijf, regio. [Statistics Netherlands. Registrered crimes; type, region.] Average of registered abuse cases ('31 Mishandeling') 2018-2022. https://opendata.cbs.nl/statline.
4. Criminaliteit en rechtshandhaving. *Ontwikkelingen en samenhangen. [Crime and law enforcement 2023. Developments and coherences.]*. Wetenschappelijk Onderzoek- en Datacentrum (WODC) [Scientific Research and Datacentre], 2024; 2023.
5. Otte R. *Jaarbericht 2023 openbaar ministerie. Tabel 10 Uitstroom Misdrijfzaken [Annual Report 2023 Public Prosecution Service. Table 10: Outflow of Criminal Cases]*. May 2024.
6. Nederlands Register Gerechtelijk Deskundigen (NRGD) [The Netherlands Register of Court Experts]. Deskundigen per deskundigheidsgebied [Experts per area of expertise]. Available from: https://www.nrgd.nl/zoek-een-deskundige.
7. Aanvraagformulier medische informatie [Medical information request form]. *Ministerie van Justitie & Koninklijke Nederlandsche Maatschappij tot bevordering der Geneeskunst (KNMG) [Ministry of Justice and Royal Dutch Medical Association]*. 2010.
8. *Handreiking Beroepsgeheim en politie/justitie [Guidance on Professional Confidentiality and Police/Justice]*. Koninklijke Nederlandsche maatschappij tot bevordering der geneeskunst (KNMG) [Royal Dutch Medical Association]; 2012.
9. *Richtlijn Omgaan Met Medische Gegevens. [Guideline on the Handling of Medical Data]*. Koninklijke Nederlandsche maatschappij tot bevordering der geneeskunst (KNMG) [Royal Dutch Medical Association]; 2024.
10. Goudswaard M, de Jong P, Dorn T, Reijnders U. Hoe wordt forensisch medische expertise bij letsel ingezet in de regio Amsterdam? [How is forensic medical expertise on injuries utilized in the Amsterdam region?]. *Expertise en Recht*. 2020;6:224–231.
11. Goudswaard M, Baljé V, Dorn T, Reijnders U. Forensisch medische informatie bij strafzaken waarbij sprake is van letsel. Het perspectief van rechters en raadsheren in de regio Amsterdam. [Forensic medical information in criminal cases involving injury The perspective of judges in the Amsterdam region]. *Expertise en Recht*. 2022;2:41–49.
12. ZonMw. Dating of injury with new markers in superficial skin biopsies. https://projecten.zonmw.nl/nl/project/dating-injury-new-markers-superficial-skin-biopsies; 2022-2026.
13. Rädiker A, Kuckartz U. *Focused Analysis of Qualitative Interviews with MAXQDA: Step by Step*. first ed. Berlin: MAXQDA Press; 2020.
14. Programmatekst forensische geneeskunde [program text forensic medicine]: ZonMw; 2020. https://www.zonmw.nl/nl/programma/forensische-geneeskunde.
15. Canela C, Buadze A, Dube A, et al. How do legal experts cope with medical reports and forensic evidence? The experiences, perceptions, and narratives of Swiss judges and other legal experts. *Front Psychiatr*. 2019;10:18. PubMed PMID: 30814957. Pubmed Central PMCID: PMC6381858. Epub 2019/03/01.

16. Meeuwissen J, de Roo R, Kruithof-van Esch J, et al. Forensic advisers working for all district courts and courts of appeal in The Netherlands: an overview and discussion. *J Forensic Sci*. 2024;69(1):182–188.
17. Wensen OMtav. Forensisch medisch onderzoek (kenmerk: PaG/B&S/17909) [public prosecution service (OM) requests regarding forensic medical examination (reference: PaG/B&S/17909)]. In: *Service] OMPP*. 2018.
18. Reijnders UJ, van Baasbank MC, van der Wal G. Diagnosis and interpretation of injuries: a study of Dutch general practitioners. *J Clin Forensic Med*. 2005 Dec;12(6): 291–295. PubMed PMID: 16301163. Epub 2005/11/23.
19. Reijnders UJ, Giannakopoulos GF, de Bruin KH. Assessment of abuse-related injuries: a comparative study of forensic physicians, emergency room physicians, emergency room nurses and medical students. *J Forensic Leg Med*. 2008 Jan;15(1): 15–19. PubMed PMID: 17011810. Epub 2006/10/03.
20. Payne-James J, Payne-James G, Cecchi R, et al. Current status of undergraduate teaching in forensic & legal medicine in Europe. *Int J Leg Med*. 2024 Sep;138(5): 1965–1976. PubMed PMID: 38630276. Pubmed Central PMCID: PMC11306729. Epub 2024/04/17.
21. *Artikel 12 Wet op de lijkbezorging [Article 12 Burial Act]*. 1992.
22. Covers MLV, Karst W, Bicanic IAE. Development of multidisciplinary sexual assault centres in The Netherlands. *Eur J Psychotraumatol*. 2022;13(2), 2127475. PubMed PMID: 36212117. Pubmed Central PMCID: PMC9542602. Epub 2022/10/11.
23. Centrum Seksueel geweld [sexual assault center]. https://centrumseksueelgeweld.nl/.
24. *Aanwijzing huiselijk geweld en kindermishandeling [Directive on domestic violence and child abuse]*. 2022.
25. Handelingskader voor het leveren van Forensisch Medische Expertise voor Kinderen (FMEK) door GGD'en. *[Action framework for the provision of forensic medical expertise for children (FMEK) by regional public health services]. GGD GHOR Nederland, Stuurgroep FMEK [Association of Public Health Services and Regional Medical Emergency Preparedness and Planning.* Steering Committee FMEK]; 2020.
26. *Handreiking Samenwerken Bij Strafbare Kindermishandeling [Guidance for Collaboration in Criminal Child Abuse Cases]. Veilig Thuis, Politie, OM, RvdK, Reclassering Nl [Safe Home, Police, Public Prosecution, Child Protection Board, Dutch Probation Service]*. 2017.
27. Onderzoeksprogramma 2024. *Letselonderzoek in het kader van het strafrecht. [Research programme 2024: Injury research in the context of criminal law.]. Politie & Wetenschap. Uitbesteding onderzoek Strategische OnderzoeksAgenda voor de Politie (SOAP)*. Politieacademie. [Police & Science. Outsourcing strategic research agenda for the police. Police Academy.]; 2024 April, 2024. Report No.
28. ZonMw. Richtlijnontwikkeling lijkschouw en FMO (forensisch medisch onderzoek). [Guideline development post mortem investigation and FMO (forensic medical examination)]. 2023-2026. Available from: https://projecten.zonmw.nl/nl/project/richtlijnontwikkeling-lijkschouw-en-fmo-forensisch-medisch-onderzoek.
29. Kunst M. Hard nodig: trauma-geïnformeerd werken in de strafrechtsketen. [Urgently needed: trauma-informed practice in the criminal justice chain.]. *Justitiele Verkenningen*. 2025;1.
30. Hendriks A, Mansvelt M. Trauma-geïnformeerd werken in huiselijk-geweldzaken: het begint met de erkenning van het geweld. [Trauma-informed practice in domestic violence cases: it starts with acknowledging the violence. *Justitiele Verkenningen*. 2025;1.
31. *Directive 2012/29/EU of the European Parliament and of the Council of 25 October 2012 Establishing Minimum Standards on the Rights, Support and Protection of Victims of Crime, and Replacing Council Framework Decision 2001/220/JHA*. 2012.
32. *Wet implementatie richtlijn minimumnormen voor rechten, ondersteuning en bescherming slachtoffers strafbare feiten enz. [Act on the Implementation of the Directive on Minimum Standards for the Rights, Support, and Protection of Victims of Crime.]*. 2017.
33. *Wet Uitbreiding Slachtofferrechten. [Act on the Expansion of Victims' Rights]*. 2021.
34. *Convention on Preventing and Combating Violence against Women and Domestic Violence*. Istanbul: Council of Europe; 2011.
35. Ernstige consequenties tekort forensisch artsen. Serious consequences of shortage of forensic doctors] 6-4-2022. https://ggdghor.nl/actueel-bericht/ernstige-consequenties-tekort-forensisch-artsen/.
36. Grapperhaus F. *Kamerstuk 33628 Forensische Zorg. Nr 62. Brief van de Minister van Justitie en Veiligheid. [Parliamentary Paper 33628 Forensic Care. No. 62. Letter from the Minister of Justice and Security.] Tweede Kamer der Staten-Generaal. [House of Representatives.]*. 26-06-2019.
37. Nieuwe campagne werving forensisch artsen: buitengewoon boeiend [New recruitment campaign for forensic doctors: exceptionally fascinating]: the campaign is an initiative of the Association of Public Health Services and Regional Medical Emergency Preparedness and Planning (GGD GHOR Netherlands), on behalf of the Public Health Service (GGD) departments and FARR. In: *Collaboration with the Forensic Medical Association (FMG) and the Netherlands School of Public & Occupational Health (NSPOH). The Campaign Is Supported by the Ministry of Justice and Security*; June 2022. https://ggdghor.nl/actueel-bericht/nieuwe-campagne-werving-forensisch-artsen-buitengewoon-boeiend/.
38. De opleiding forensisch arts. [The forensic doctor training program]. https://kiesvoorforensischegeneeskunde.nl/.
39. ZonMw. De dood of de gladiolen: taakherschikking om de forensische zorg te kunnen blijven organiseren. [Death or gladioli: task rescheduling to be able to continue to organize forensic care]. 2023-2025. https://projecten.zonmw.nl/nl/project/de-dood-de-gladiolen-taakherschikking-om-de-forensische-zorg-te-kunnen-blijven-organiseren.