



Child abuse, comparative analysis of national and European models and case studies[☆]

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ABSTRACT

Background: Child Abuse is described as a major public health problem, requiring a standardized and multidisciplinary approach.

Objective: The aim of the study is to evaluate the application of the operative protocols that have been used in the management of suspected cases of child abuse, provided by PDTA (Diagnostic–Therapeutic Care Pathway) of Palermo, and their conformity to the scientific literature (“Royal College of Pediatrics and Child Health” and “Adams’s classification”).

Participants and setting: The study was conducted on a clinical-legal database of 55 patients, which have been followed from 2013 until 2025, evaluating demographic variables, modality of the abuse and the mode of access (urgent vs scheduled).

Methods: We proceeded with a process of data normalization, terminological cleaning and removal of outliers to ensure consistency in the analysis and the validity of statistical analyses and epidemiological interpretations.

Results: The explorative analyses of the database highlighted a significant prevalence in the female gender (62,2%), of intra-familial cases (where the most frequent perpetrator is the father), of recurrent cases, and a bimodal distribution of the age with two peaks (3–6, 11–14 years with mean age 8.3 years). The 79,5% of the consultations were carried out on a scheduled basis, suggesting delays in activating the diagnostic-therapeutic pathway; in fact, a greater clinical-legal plausibility of abuse was observed in cases assessed urgently ($p = 0.38$).

Conclusions: Most cases were managed on a scheduled basis despite higher clinical-legal plausibility in urgent assessments; cases predominated in females, showed bimodal age peaks (3–6 and 11–14 years), and were largely intra-familial with fathers most frequently implicated. Findings support earlier activation of the pathway and standardized data capture across services.

1. Introduction

Child abuse is a complex and sensitive issue, considered by WHO today as a serious public health problem, with serious and long-lasting consequences, which is why research has highlighted the need for a univocal definition, without which it was difficult to correctly estimate the incidence and prevalence, and an accurate diagnosis and treatment, which, after various local protocols, led to a global protocol. According to the Global status report on preventing violence against children of the World Health Organization of 2020, it is estimated that one in two children, between 2 and 17 years old, suffers some form of violence

every year, equal to approximately one billion minors. The available data, although alarming, represent only the tip of the iceberg, due to the underestimation of the phenomenon caused by difficulties in diagnosing, reporting and recording cases.

In Italy there is still no national model but several regional models, each with its own peculiarities, which reflect the different periods and contexts in which they were born.

All the protocols present a common vision [Emilia-Romagna Guidelines 2010/2017; Veneto Regional Guidelines 2016; Friuli-Venezia Giulia Protocol 2019], which focuses on the importance of a multidisciplinary approach that synergistically involves health workers

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from the various disciplines (gynecology, pediatrics, forensic medicine, child neuropsychiatry, psychology), social workers and the Prosecutor's Office, the Juvenile Court, with the ultimate goal of ensuring timely intervention, aimed at protecting minors and ensuring their psycho-physical well-being. Another fundamental point is the continuous and specific training of health workers in the field; furthermore, all the protocols present written guidelines with the description of the operational phases of the evaluation, and the Emilian model is the most detailed [1].

The reference points are those of Padua (DGR, Regional Council Resolution, 2989/2000) and Florence, which represent specialist centers that work within hospitals. In particular, that of Padua (DGR 2989/2000) is the oldest, in fact the project was born in 1987 and found its full implementation in 2006, when a real Third Level Hospital Service was established within the Department for Women's and Children's Health of the University Hospital of Padua, equipped with hospital beds, both ordinary and day-hospital, and an outpatient and consultancy service for the entire region, with direct legal responsibility. The service has dedicated staff (full time, 7), a nursing shift always active and 29 consultant doctors. The need for a real hospital service arises from the fact that, although minors who are victims of abuse represent a small percentage, they require high resources to which only a real hospital service can respond adequately. Furthermore, the center also guarantees specific training and research activities in the field and has collected approximately 1700 cases in the last 35 years [2].

At the regional level in Veneto, guidelines were subsequently issued in 2016, which provide for a model centered on the use of territorial Specialist Teams, focusing on the territorial approach and strengthening continuity of care [3].

The Protocol of the AAS 5 of Friuli-Venezia Giulia, updated in 2019, adopts a more generalized approach; in fact, it is applied not only to minor abuse victims, but to all age groups. This model provides for two different types of assessment, one for urgent cases and one for non-critical situations that are managed in the clinic. The key point of this model, compared to the others, is its attention to the acquisition, documentation and conservation of biological and forensic evidence, with the goal of ensuring not only the psycho-physical protection of the minor, but also protecting the evidentiary validity in criminal proceedings [4].

The Emilia-Romagna Guidelines, active since 2010 and updated in 2017, represent one of the most structured and effective models at a national level, also thanks to the ecological vision of the phenomenon and the use of the Integrated Multidisciplinary Teams (EMI) and the Integrated Functional Units (UFI), which represent a point of connection of the network, made up of hospitals, clinics, social services. Another strong point of the Romagna model is the coverage of forms of abuse such as online abuse, bullying, pathologies of care [5].

The MAIA Working Group (Abused Minors in Reception) of the A.O. R.N. Santobono Pausilipon, Santobono Hospital in Naples represents one of the most recent centers, always created in response to the emerging problem related to the increase in cases of child abuse. It is a multidisciplinary team that includes medical directors of the UOC of Emergency Pediatrics Brief Observation and Emergency Room, of child neuropsychiatry and of the clinical psychologist, of the medical examiner, of the health assistant of the facility and of the health management and then of the gynecologist, in external agreement. Unlike the center in Padua, here there is no dedicated service, but hospitalizations, if necessary, are carried out directly in OBI/Emergency Pediatrics. However, a dedicated clinic and internal training services will soon be activated [6].

Another center of excellence is represented by the GAIA (Childhood and Adolescent Abuse Group) of the Meyer IRCCS University Hospital Company, which was founded in 2005 and recognized in 2015 as a Service [7]. It is a Service that presents different modes of action by not only the Emergency Department, but also by the other Departments of the Hospital, the Territorial Services, the Free Choice Pediatricians, the General Practitioners, but also by the schools. It is applied both in

emergency and scheduled regimes and presents outpatient services. From 2008 to 2023, the GAIA recorded 1350 cases, of which in 2023 50% concerned foreigners [8]. Finally, in Bari, at the Policlinico, the GIADA center (Interdisciplinary Group for the Reception and Diagnosis of Abuse) joined the Hospital Network in 2019, and operates by coordinating a regional network, which includes several hospital and territorial facilities. It provides an in-hospital care protocol in emergency conditions (level III), a hospitalization, day hospital and outpatient regime and a service dedicated to "special orphans" (minors whose mother was killed by their father) 9,10. These different hospital models, despite operating in different regional contexts, with different services available, share the general structure and converge on the main points, such as the psycho-physical well-being of minors as the main objective, the timeliness of the response, the multidisciplinary in the evaluation. The comparative analysis of these instruments, therefore, highlights the need for national harmonization that, while respecting territorial specificities, ensures uniformity of rights, tools and responses to minors, victims of violence throughout the Italian territory.

Additionally, at a European level there are no international guidelines, but there is still a fragmentation and a heterogeneous approach to the phenomenon. Each nation, based on the economic, legal and organizational influences of each state, presents its own protocol, which as already reiterated for Italy in turn is not always unique for the entire territory. In 2024, "The Lancet Regional Health" conducted a systematic review at European level (30) to evaluate the NCPGs (National Practice Guidelines) existing in the 34 countries of the WHO European Region and highlighted important structural and content gaps, in fact only 6 guidelines for the management of cases of abuse out of 24 European countries (25%) achieved a valid score (above 50 out of 101) according to the WHO Standards.

According to Otterman et al. [11], the highest scoring guidelines were those of Moldova, Germany, and Belgium, whereas Croatia, Denmark, and the United Kingdom achieved the lowest scores.

In some countries, a total absence of guidelines has been found, and health workers in this case can follow the WHO guidelines or general recommendations or, if they exist, regional protocols.

A significant deficiency has been found both in scientific rigor, due to a lack of clear methodology and systemic studies, such as *meta*-analysis, and in clinical practice; in particular, data have emerged, which reflect the lack of respect and compliance with the WHO guidelines on prophylaxis and treatment for STIs, on the prevention and clinical management of pregnancy and on psychological interventions.

To date, it is hoped that international guidelines will be achieved, which are based on rigorous scientific studies, in compliance with the AGREE II criteria [12], which provide tools for monitoring cases at European level, and which can be adapted to the various application contexts of the different European countries.

The aim of the study conducted at the University Hospital of Palermo is to review the local case history of the facility, evaluating the application of the operational protocols used, provided by the PDTA, used in the management of cases of suspected child abuse.

The Palermo Diagnostic-Therapeutic Care Pathway (PDTA) is an integrated, multi-agency protocol jointly adopted by the University Hospital and the public Children's Hospital. Activation occurs either urgently through Emergency Department triage or as a scheduled referral from pediatricians, social services, or judicial authorities. The PDTA standardizes consent, forensic photodocumentation and sampling, specialist consultations (pediatrics, gynecology, forensic medicine, child neuropsychiatry, psychology), and inter-institutional reporting. Compared to other Italian models, it emphasizes integration between clinical-legal practice and the judicial system.

The document was drawn up in line with national and international guidelines on the subject and represents a fundamentally important tool for ensuring that the minor is taken into care quickly and adequately observed by multidisciplinary doctors, performed by doctors specialized in the field, in compliance with measures also aimed at ensuring the

well-being of operators[13]. The protocol, in fact, provides for collaboration between the various specialists, such as the gynecologist, the pediatrician, the medical examiner and the psychologist.

The main objective of the study is to evaluate whether these protocols have been applied and whether this has been done within the expected timeframes. Another fundamental point of the study was to critically examine the way in which the visits were conducted and their compliance with the scientific literature, with the recommendations established by the “Royal College of Pediatrics and Child Health” [14] and the “Adams classification” [15], with the aim of ensuring an approach compliant with international standards of diagnostic accuracy, sensitivity and specificity. These standards were selected because the RCPCH Child Protection Evidence represents one of the most authoritative international syntheses for child abuse assessment, while the Adams classification provides a validated taxonomy for interpreting physical and anogenital findings.

2. Methods

2.1. Study sample and data collection

The study was carried out on a total of 55 patients, who were followed by professionals specializing in forensic medicine working in the University Hospital of Palermo from 2013 to 2025. The sample includes both the cases of hospital observation received through the PDTA activated with the other city companies (attached), and the cases received either as Prosecutor-ordered expert opinions (court-appointed technical expertise) or as Court-appointed expert reports (expert reports), depending on the judicial authority. (Chart1).

2.2. Tool

The PDTA workflow comprises activation (urgent vs scheduled), triage, consent procedures, collection of biological material and photographic documentation, specialist consultations, notification to hospital management, social services, police, and judicial authorities, and final decision on discharge or admission.

During the study, the PDTA was taken into consideration for the care of minors who are victims of abuse, which was adopted and applied by the public Child Hospital and the University Hospital, both of Palermo.

PDTA can start for various reasons and consequently be carried out in different contexts:

- the minor can be accompanied directly to the pediatric emergency room and therefore the evaluation is carried out in an emergency regime.
- the visit can be scheduled at the request of the police, social workers, the pediatrician or the parent or guardian.

When the minor accesses the emergency room, the PDTA is activated immediately. The first step of the protocol is triage, which is carried out by a member of the nursing staff, who then notifies the Pediatric Emergency Unit doctor (PEU doctor). During triage, the nurse will have to collect the personal data of the minor and the accompanying person, the anamnesis, evaluate the vital parameters, if there are signs of trauma, and assign a color code based on the urgency of the case. At this

point the minor is accompanied to the examination room, which will be conducted in the presence of the nurse, the psychologist and an adult the child trusts, unless the latter refuses to be present. The doctor must organize the visit in a quiet and private place. During the visit, a form will be filled out in which all the information collected must be reported and in which the Tanner staging for males and females is present, and the body diagram, of the head and neck, of the hands and wrists, and of the oral cavity, where the lesions found during the objective examination must be indicated.

If there is suspicion or certainty of abuse, the doctor will ask the parent or legal guardian for consent to collect biological material and photographic documentation for forensic purposes. In cases where the parent or guardian refuses, or is absent or is the alleged abuser, the doctor can contact the Public Prosecutor of the Public Prosecutor's Office at the Juvenile Court to obtain consent [16].

At this point, specialist consultations may be requested in Forensic Medicine, Gynecology for the anogenital examination for female minors, and Surgery for male children, who may then request further tests and arrange for the collection of biological material and photographic documentation. Finally, the Medical Direction of the Hospital is notified and the Social Service, the Police and the Judicial Authority are reported.

At the end of this process, if the minor has minimal injuries, the parent or guardian is reliable and there is no risk of repetition of the abuse, a discharge agreed with the Social Service and the Judicial Authority may take place; on the contrary, if there are serious injuries, risk of repetition, incomplete medical examination and unreliable guardian or parent, then the minor will be hospitalized, which may take place either in OBI or as ordinary hospitalization.

Then we proceeded with a process of data normalization, grouping, terminological cleaning and removal of outliers to ensure consistency in the analysis to ensure the validity of subsequent statistical analyses and to support consistent epidemiological interpretations.

3. Results

The exploratory analysis of the database allowed us to highlight some recurring characteristics in cases of suspected child abuse. The variable “gender” shows a clear prevalence of female subjects (62.2%), with significant heterogeneity in the compilation methods (e.g. “F”, “Female”, “M.”, Male), which required a process of normalization of the textual data (Table 1).

The average age of the subjects, once the anomalous values were excluded, was 8.3 years old, with a median of 6.5 years old. The distribution is bimodal, with a first peak between 3 and 6 years and a second between 11 and 14 years, confirming the vulnerability of these age groups. An outlier was identified at 34 years, which was excluded from subsequent analyses as it was not compatible with the target of the population studied (Chart 2).

Regarding the urgency of the consultation, a clear predominance of scheduled assessments emerges (79.5% of valid cases), while urgent consultations are a minority (Chart 3). Here too, it was necessary to standardize the non-standardized text entries (“URG”, “Urgency”, etc.), and precisely:

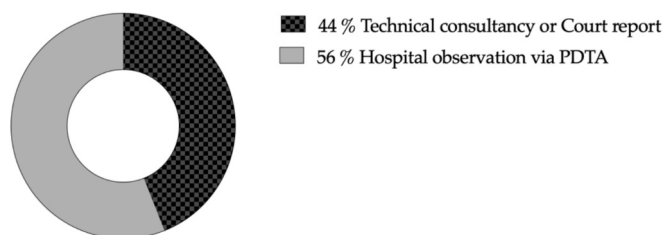


Chart 1. Distribution based on access mode.

Table 1 Percentage distribution by “gender”.

Age cohort (years)	Female n (%)	Male n (%)	Total n (%)
0–2	3 (5.5)	2 (3.6)	5 (9.1)
3–6	12 (21.8)	6 (10.9)	18 (32.7)
7–10	5 (9.1)	4 (7.3)	9 (16.4)
11–14	10 (18.2)	6 (10.9)	16 (29.1)
15–17	4 (7.3)	3 (5.5)	7 (12.7)
Total	34 (62.2)	21 (37.8)	55 (100)

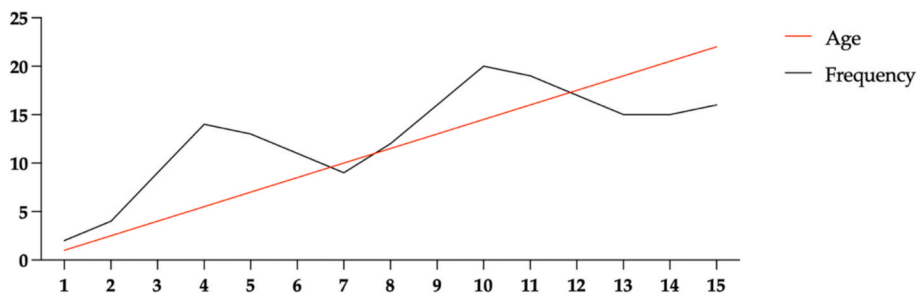


Chart 2. Distribution by "age".

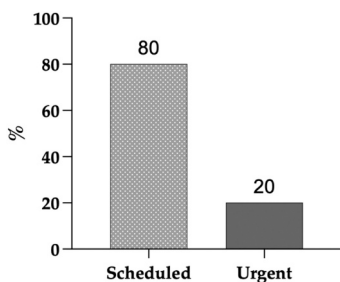


Chart 3. Percentage distribution by "presentation method".

- Urgent = same-day assessment activated at Emergency Department triage or on judicial/police fast-track;
- Scheduled = planned appointment after referral from pediatricians/social services/family

The variable relating to the alleged perpetrator of the abuse presents a variety of indications: the most frequently reported subjects are the father, the boyfriend (of the victim or the mother) and, to a lesser extent, the uncle or other family members. Here too, a terminological grouping and cleaning was carried out to ensure consistency in the analysis (Chart 4).

This phase of normalization and cleaning of the dataset was essential to ensure the validity of subsequent statistical analyses and to support consistent epidemiological interpretations. The results suggest the need for greater attention to the quality of data collection in the clinical-legal field, as well as the importance of shared protocols for the entry and management of information in cases of suspected abuse.

The variable "gender" shows an unbalanced distribution, with a clear prevalence of female subjects. After normalizing the textual data, it was observed that 62.2% of the cases concerned female minors, while males represented 35.1%. A small residual share (2.7%) consists of missing or irregular values. This data reflects a trend already observed in the literature, in which the victims of sexual abuse are predominantly female, even if it is known that in males the phenomenon could be underestimated due to a lower propensity to report or detect by health and social services.

The analysis of the variable "age" required careful cleaning due to

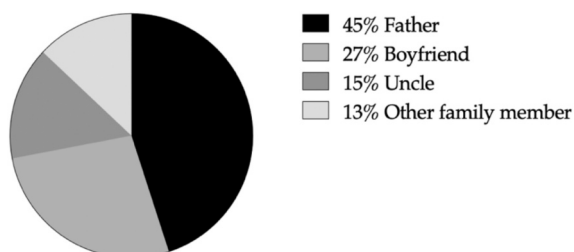


Chart 4. Percentage distribution by "author".

the presence of non-numeric or anomalous values (e.g. letters, age over 18 years). After removing the outliers and converting to numeric format, the distribution shows a mean age of 8.3 years, with a range between 0.58 years (≈7 months) and 17 years, and a median of 6.5 years. The distribution appears bimodal: a first peak in frequency is between 3 and 6 years of age, indicative of reports in preschool age, while a second peak between 11 and 14 years of age coincides with preadolescence and the beginning of adolescence. These age groups are particularly vulnerable both physically and psychologically, with significant implications in terms of support and protection.

The variable "priority of assessment", indicated in the reports as "urgent" or "scheduled", was subject to semantic harmonization due to alternative terms present in the dataset (e.g. "urgency", "scheduled", "urg"). After cleaning, it is observed that most cases (about 79.5%) were managed with scheduled assessments, while only 20.5% received an urgent assessment. This data may reflect a double reality: on the one hand, the difficulty of intercepting acute episodes early, on the other, the late activation of specialist pathways, which often occurs upon referral by social, school or pediatric services, following an initial non-emergency assessment.

For the variable "duration of abuse", a significant heterogeneity in response formats was detected, with many different textual entries (e.g. "single episode", "2–3 months", "about 1 year", etc.) and a considerable share of missing values (over 57%). In the available cases, the most frequent form is that of the "single episode", present in 12.5% of the total subjects, while the others report periods ranging from weeks to months, in some cases up to a year. The presence of long-term abuse in childhood highlights the need for effective early detection strategies, as well as the importance of protected environments for listening to the minor.

The field relating to the time elapsed between the abuse and the forensic evaluation is populated in less than half of the cases, with very varied indications: from specific entries such as "12 h" or "10 days" to more vague expressions such as "about a week" or "not known". Among the readable data, most visits are within a week of the reported event, but there is no lack of evaluations performed days or weeks later, often on reactivation of the memory or following secondary disclosure (e.g. during psychological or educational interviews). Delays in the forensic visit can compromise the acquisition of useful biological findings, making the role of anamnesis and clinical observation even more crucial. The "possible perpetrator" field is extremely significant from a clinical-legal and social point of view. Here too, a process of semantic unification was necessary, with grouping of similar entries (e.g. "natural father" and "father"). The most frequently reported perpetrator is the victim's father, followed by boyfriends (of the minor or the mother), uncles, grandparents and in some cases unknown subjects or peers. The high incidence of intra-family abuse (intrafamilial) confirms the importance of a multidisciplinary approach, involving not only the clinical field, but also the educational, psychological and judicial fields, to effectively protect minors in complex or dysfunctional family environments.

To explore possible linear relationships between the main variables

of the dataset, a correlation matrix was calculated between the subjects' age, gender (coded as a binary variable, with a value of 1 for females) and the priority of the clinical-legal assessment (also coded binary, with a value of 1 for urgent cases). The results show overall weak correlation values, all lower than 0.2, indicating a poor linear association between the variables examined. In particular, the correlation between age and gender was found to be equal to $p = 0.076$, suggesting the absence of a systematic link between these two variables. The coefficient between age and urgency is slightly higher ($p = 0.159$), indicating a weak tendency for the probability of urgent consultation to increase with increasing age. The relationship between female gender and urgency also shows a modest correlation ($p = 0.131$), without however reaching values that suggest a statistically significant or clinically relevant relationship.

The expansion of the correlation analysis (Chart 5 and Table 2) to new binary variables provided more detailed information on the relationships between age, gender, priority of assessment, nature of abuse, identification of the perpetrator and medico-legal plausibility.

Age shows a weak negative correlation with the identification of a known perpetrator ($p = -0.17$), suggesting that in younger subjects the perpetrator is more frequently identified. The correlation with medico-legal plausibility is minimal ($p = 0.07$), as is with urgency ($p = 0.03$).

Female gender moderately negatively correlated with the plausibility of abuse ($p = -0.30$), indicating that in cases with greater medico-legal plausibility the subjects are more often male, despite a sample dominated by females. The relationship with single abuse ($p = -0.19$) also suggests that in male subjects proportionally more unique episodes are detected than in females.

The "urgent" priority is the only variable with significant moderate correlations with many items as the plausibility of the abuse ($p = 0.38$), suggesting that cases assessed as more well-founded are also more often managed urgently and the identification of the known perpetrator ($p = -0.33$), indicating that in urgent cases the perpetrator is more often unknown or unidentified, as in acute cases with recent disclosure.

The "single abuse" variable shows weak negative correlations with plausibility ($p = -0.17$) and with the known perpetrator ($p = -0.19$), consistent with the observation that repeated abuse is often associated with known family contexts and more in-depth investigations.

Finally, medico-legal plausibility is weakly associated with multiple factors, but shows a moderate relationship with the urgency of the

Table 2
Correlation table.

Variable 1	Variable 2	Correlation coefficient
Plausible	Urgency	0.38
Known Offender	Urgency	-0.327
Plausible	Female Gender	-0.302
Femalegender	Numeric Age	-0.261
Singleabuse	Female Gender	-0.192
Known Offender	Single Abuse	-0.192
Known Offender	Numeric Age	-0.174
Plausible	Single Abuse	-0.174
Urgency	Female Gender	0.14
Known Offender	Female Gender	-0.111
Single Abuse	Urgency	0.081
Plausible	Numeric Age	0.079
Urgency	Numeric Age	0.037
Plausible	Known Offender	0.034
Single Abuse	Numeric Age	0.03

Note: Kindly take care Section 4.1 and 4.2.

assessment ($p = 0.38$), reinforcing the idea that the timeliness of the consultation is often driven by clinical elements already perceived as significant.

4. Discussion

The results obtained from the study conducted at the Institute of Legal Medicine of the University Hospital of Palermo, have highlighted the complexity of the multidisciplinary care pathway of the abused child, highlighting not only its strengths but also its limits and critical issues. The study has revealed data that are reflected in international literature, such as the greater protection of the female gender and of preschool children given the greater prevalence in these two categories. In the context of the analysis of cases of alleged abuse, the possible link between the gender of the minor and the degree of plausibility attributed to the story or the symptoms was assessed, as resulting from the medico-legal considerations formulated by the consultants. To this end, the assessments contained in the clinical-legal reports were subjected to an extended textual coding process, aimed at classifying the conclusions expressed in terms of high plausibility (e.g. "class 1", "highly suspicious", "probable abuse", "indicative of abuse") or zero or doubtful plausibility (e.g. "no indication of abuse", "absence of compatible signs", "implausible"). Despite this, the descriptive analysis of the subgroup shows that the cases for which a medico-legal assessment oriented towards a greater plausibility of abuse was expressed include both female and male subjects, with a tendency – albeit minimal and not generalizable – towards the presence of males in the cases judged to be more likely. This observation, although deprived of statistical validation, is suggestive considering the composition of the overall sample, in which females represent the clear majority. Consequently, it could be hypothesized that, in the few cases in which abuse is considered clinically and legally plausible, the male gender is overrepresented compared to its numerical weight within the sample. This phenomenon may reflect multiple dynamics: on the one hand, a different mode of symptomatic expression in males that makes the signals more "visible" or more easily interpretable; on the other, possible perceptual or diagnostic biases. In any case, the reduced number of data relating to the male gender represents a clear limitation to the global methodological application. Therefore, any consideration relating to the male gender must be understood as preliminary and exploratory, which also confirms the data in the literature on abuse of male minors is an underestimated phenomenon.

Equally relevant is the correlation found between clinical-legal plausibility and the timeliness of the assessment; in fact, it was observed that in the cases observed in urgency ($p = 0.38$), despite these representing a smaller percentage compared to the total number of visits, there was a greater probability of formulating a diagnostic

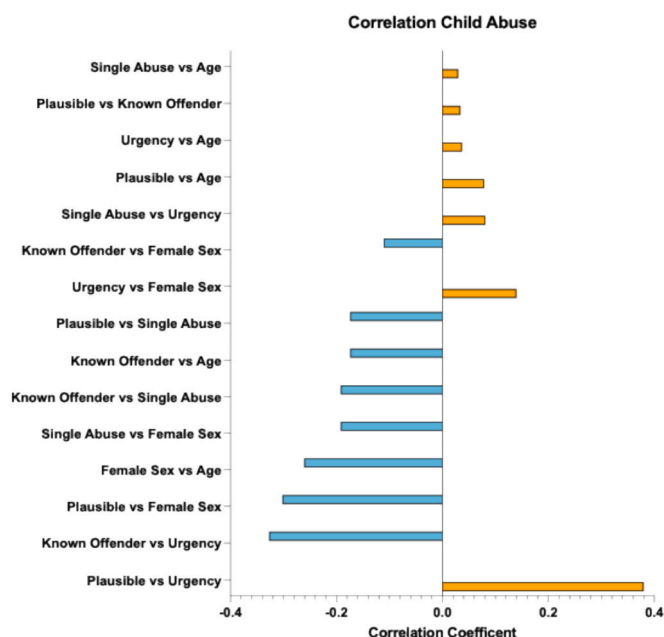


Chart 5. Correlation chart.

judgment of abuse. The latest international guidelines of the RCPCH and Adams, recommend that the minor should be guaranteed an evaluation as early as possible, since the significance of clinical signs and laboratory results is time-dependent. The high percentage of cases evaluated in a scheduled regime (79.5%), a long time from the date of the suspected abuse, compared to the latest national investigations, in which the percentage of cases requested by the Prosecutor's Office is only 52%, has highlighted a delay in the activation of the protocols, which could have influenced the ability to diagnose abuse, determining an underestimation of the phenomenon, as can be seen from the reduced number of the sample, also suggesting greater integration between the judicial and health systems. Another fundamentally important fact is the higher incidence of intra-family abuse, a fact which is in agreement with the "III National Survey on the Mistreatment of Children and Adolescents in Italy", which highlights the importance of pathways which involve not only health workers but also social workers and judicial authorities aimed at establishing an integrated system which safeguards and guarantees greater protection of the child.

Some study has allowed us to highlight the limits and critical issues in the diagnostic-therapeutic care pathway, which is currently used.

Through the study, the need for shared, standardized and computerized protocols emerged, given the substantial heterogeneity found in the data collected, which required extensive standardization work, which affects the quality of the analyses performed. It also underlines the importance of specific training for healthcare workers, to be able to recognize and activate the pathways in the shortest possible time and obtain timely diagnoses.

4.1. Strengths and limitations

The findings underscore the importance of early activation of multidisciplinary pathways in suspected child abuse, particularly in order to preserve forensic evidence and improve diagnostic accuracy. From a medico-legal perspective, timely assessment may reduce uncertainty in the interpretation of clinical findings and support more robust judicial decision-making. Furthermore, the observed variability in data recording highlights the need for standardized documentation tools and targeted training programs for healthcare professionals, aimed at improving both clinical management and the quality of forensic evaluations.

4.2. Clinical and medico-legal implications

This study has several strengths, including the integration of clinical, forensic, and judicial data within a structured diagnostic-therapeutic pathway, and the long observation period spanning more than a decade. However, some limitations should be acknowledged. The relatively small sample size and the retrospective design may limit the generalizability of the findings. In addition, potential referral bias cannot be excluded, as cases evaluated in a tertiary forensic setting may represent more complex or suspected situations. The heterogeneity of historical records required extensive data cleaning, which, although systematically performed, may introduce residual misclassification. These aspects should be considered when interpreting the results.

5. Conclusions

The diagnosis of abuse is a complex reality. The experimental analysis underscores the need for greater attention to the quality of data collection in the clinical-legal field, as well as the importance of shared protocols and inter-institutional synergy for the entry and management of information in cases of suspected abuse. This study highlighted that most suspected child abuse cases in Palermo were managed on a scheduled basis, although urgent assessments showed higher medico-legal plausibility. The sample demonstrated a predominance of females, bimodal age peaks at 3–6 and 11–14 years, and a strong intra-

familial component, with fathers most frequently implicated. These findings emphasize the importance of early activation of the PDTA, standardized data collection, and close integration between healthcare and judicial authorities.

Ethical

This study was conducted in accordance with the ethical principles outlined in the Declaration of Helsinki. All procedures involving human data were carried out as part of routine clinical and forensic practice, with anonymized data used for research purposes. No experimental interventions were performed. Ethical review and approval were not required, in accordance with institutional and national guidelines for retrospective observational studies.

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Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Glossary of Acronyms

- **PDTA** – *Percorso Diagnostico-Terapeutico-Assistenziale* (Diagnostic–Therapeutic Care Pathway).
- **OBI** – *Osservazione Breve Intensiva* (Short-Stay Observation Unit).
- **UOC** – *Unità Operativa Complessa* (Hospital Department/Division).
- **PEU doctor** – *Pediatric Emergency Unit doctor*.
- **GAIA** – *Gruppo Abuso Infanzia e Adolescenza* (Childhood and Adolescent Abuse Group, Meyer University Hospital, Florence).
- **GIADA** – *Gruppo Interdisciplinare per l'Accoglienza e la Diagnosi di Abuso* (Interdisciplinary Group for the Reception and Diagnosis of Abuse, Bari).
- **MAIA** – *Minori Abusati In Accoglienza* (Abused Minors in Reception, Naples).
- **EMI** – *Équipe Multidisciplinare Integrata* (Integrated Multidisciplinary Team, Emilia-Romagna Guidelines).
- **UFI** – *Unità Funzionale Integrata* (Integrated Functional Unit, Emilia-Romagna Guidelines).
- **DGR** – *Delibera di Giunta Regionale* (Regional Government Resolution).
- **RCPCH** – *Royal College of Paediatrics and Child Health*.
- **WHO** – *World Health Organization*.
- **NCPGs** – *National Clinical Practice Guidelines*.
- **AGREE II** – *Appraisal of Guidelines for Research and Evaluation II* (international tool for guideline evaluation).
- **CSA** – *Child Sexual Abuse* (term used in RCPCH guidelines).

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