International Journal of Medical and Pharmaceutical Research

Online ISSN-2958-3683 | Print ISSN-2958-3675
Frequency: Bi-Monthly
Available online on: https://ijmpr.in/

Original Article

Determinants of Physical Injury Detection among Female Survivors of Alleged Sexual Assault under the POCSO Act: A Retrospective Analytical Study from Eastern India

Swarnali Mukherjee[1], Kallol Roy[2], Satrajit Roy[3]

[1,2] Assistant Professor, Department of FMT, Barasat Govt. Medical College & Hospital, WB
[3] Senior Resident, Department of FMT, Barasat Govt. Medical College & Hospital, WB

Corresponding Author:

Dr. Swarnali Mukherjee
Assistant Professor, Department of FMT, Barasat Govt. Medical College & Hospital, WB.

Received: 17-03-2026
Accepted: 15-04-2026
Available online: 30-04-2026

ABSTRACT

Background: The Protection of Children from Sexual Offences (POCSO) Act, 2012 was enacted to provide a comprehensive legal framework for the protection of children against sexual offences in India. Forensic medical examination plays a pivotal role in documenting physical findings, collecting evidence, and assisting judicial interpretation. However, demonstrable physical injuries are not uniformly observed among survivors of sexual assault. Understanding the factors that influence injury detection is essential for accurate medico-legal interpretation and to avoid erroneous conclusions regarding the occurrence of abuse.

Objectives: To determine the prevalence and pattern of genital and extra-genital injuries among female survivors of alleged sexual assault examined under the POCSO Act and to identify factors associated with physical injury detection.

Materials and Methods: A retrospective analytical study was conducted in the Department of Forensic Medicine and Toxicology of a tertiary care teaching hospital in Eastern India. Medico-legal records of female survivors of alleged sexual assault examined under the POCSO Act during the study period were reviewed. Sociodemographic characteristics, assault-related variables, reporting interval, survivor–accused relationship, and injury findings were extracted using a structured data collection format. Descriptive statistics and appropriate analytical tests were used to evaluate factors associated with injury detection.

Results: Twenty-five female survivors were included in the study. The majority belonged to the 11–15-year age group. Genital injuries were documented in most survivors, whereas extra-genital injuries were infrequent. Old healed hymenal tears constituted the commonest genital finding, followed by recent hymenal tears. Most survivors were examined within five days of the alleged incident. Known perpetrators accounted for the majority of cases. Delayed reporting and known-perpetrator assaults were more frequently associated with healed genital findings, while recent injuries were relatively more common in assaults involving unknown assailants.

Conclusion: Physical injury detection among female survivors examined under the POCSO Act is influenced by multiple factors, including reporting interval, survivor–accused relationship, and assault characteristics. The absence of extra-genital injuries should not be interpreted as evidence against sexual assault. Careful interpretation of medico-legal findings, supported by comprehensive history and timely examination, remains essential for ensuring justice in child sexual abuse cases.

Keywords: *POCSO Act; Child Sexual Abuse; Sexual Assault; Forensic Examination; Genital Injury; Hymenal Tear; Injury Detection.*

INTRODUCTION

Child sexual abuse remains a significant public health and medico-legal concern worldwide. Beyond its immediate physical consequences, affected children often experience long-term psychological, behavioural, and social repercussions that may persist into adulthood. The World Health Organization recognizes violence against children as one of the most

underreported forms of abuse, with profound physical, psychological, behavioural, and social consequences extending into adulthood.[1] Despite increasing awareness and strengthened legal frameworks, many survivors continue to face barriers to disclosure and access to appropriate medical and judicial services.

In India, the enactment of the Protection of Children from Sexual Offences (POCSO) Act, 2012 marked a significant advancement in child protection legislation. The Act provides comprehensive and gender-neutral definitions of sexual offences, mandates child-friendly procedures during investigation and trial, and emphasizes prompt medical examination of survivors.[2] The forensic examination of children alleging sexual assault serves multiple purposes, including documentation of injuries, collection of biological evidence, diagnosis and treatment of medical conditions, prophylaxis against sexually transmitted infections, and generation of objective medico-legal evidence.[3]

Forensic interpretation of physical findings in suspected child sexual abuse is often challenging. Clinicians are frequently required to explain the absence of injuries in situations where the history strongly suggests abuse. Contrary to common misconceptions, the absence of demonstrable injuries does not exclude the possibility of sexual assault. Several studies have shown that a substantial proportion of children examined following alleged sexual abuse have either normal findings or non-specific physical signs.[4,5,9-12] Factors influencing injury detection include the age of the survivor, anatomical characteristics of genital tissues, nature and frequency of penetration, use of force, degree of resistance, interval between the incident and examination, repeated exposure, and the relationship between the survivor and the accused.

Published literature demonstrates considerable variation in the prevalence of genital and extra-genital injuries among survivors of child sexual abuse. Differences in study populations, examination techniques, reporting intervals, and definitions of injury contribute to these inconsistencies.[6,9,10] Furthermore, most Indian studies have primarily described demographic profiles and assault characteristics, while comparatively few have specifically examined determinants influencing the detection of physical injuries.

Understanding why some survivors demonstrate injuries while others do not is crucial, particularly in courtroom settings where the absence of injuries is often misunderstood. Misinterpretation of the absence of injuries may adversely affect judicial proceedings and reinforce misconceptions regarding the validity of allegations. Conversely, appropriate interpretation of injury patterns may provide valuable insights into the dynamics of abuse and facilitate evidence-based testimony.

The present study was undertaken to evaluate the prevalence and pattern of genital and extra-genital injuries among female survivors of alleged sexual assault examined under the POCSO Act and to identify factors associated with physical injury detection in a tertiary care forensic centre in Eastern India.

MATERIALS AND METHODS

Study Design

A retrospective analytical study was conducted to evaluate factors associated with the detection of physical injuries among female survivors of alleged sexual assault examined under the Protection of Children from Sexual Offences (POCSO) Act.

Study Setting

The study was carried out in the Department of Forensic Medicine and Toxicology at a tertiary care referral centre catering to a large urban and peri-urban population of Eastern India.

Study Period

Medico-legal examination records of eligible survivors examined between **January 2021 and June 2022** were reviewed for the purpose of the study.

Study Population

The study population comprised female survivors aged less than 18 years who were brought to the Department of Forensic Medicine and Toxicology for medico-legal examination following allegations of sexual assault under the provisions of the POCSO Act.

Inclusion Criteria

1. Female survivors aged below 18 years examined under the POCSO Act during the study period.
2. Availability of complete medico-legal examination records containing details of history, physical examination findings, and injury documentation.
3. Records with adequately documented genital findings.

Exclusion Criteria

1. Cases in which medico-legal examination was refused or not completed.
2. Records with incomplete documentation of relevant study variables.

3. Duplicate entries or repeat examinations of the same survivor.

Sampling Technique and Sample Size
A retrospective review of all eligible medico-legal records during the study period was undertaken using a consecutive sampling approach. Although the calculated sample size based on anticipated prevalence estimates was higher, only twenty-five records fulfilled the predefined eligibility criteria and contained complete information required for analysis. These twenty-five cases constituted the final study sample.

Data Collection
Data were extracted from medico-legal examination records using a structured data abstraction form specifically designed for the study.

The following variables were collected:
Sociodemographic Variables
- Age of survivor
- Educational status
- Marital status
- Occupation
- Socioeconomic status

Assault-related Variables
- Relationship between survivor and accused
- Age of accused
- Place of occurrence
- History provided by survivor
- Alleged substance uses by accused
- Time interval between the alleged incident and medico-legal examination

Injury-related Variables
- Presence or absence of genital injuries
- Presence or absence of extra-genital injuries
- Hymenal status (intact hymen, recent hymenal tear, old healed hymenal tear)
- Distribution and type of extra-genital injuries

Outcome Variable
The primary outcome variable was the **detection of physical injury**, defined as documentation of genital and/or extra-genital injuries during medico-legal examination.

Statistical Analysis
Data were entered into Microsoft Excel and analysed using Statistical Package for the Social Sciences (SPSS) software version 26.0 (IBM Corp., Armonk, NY, USA).
Continuous variables were summarised using mean and standard deviation or median and range, depending upon data distribution.

Categorical variables were expressed as frequencies and percentages.
Associations between categorical variables and injury detection were assessed using the Chi-square test or Fisher's exact test wherever appropriate. Odds ratios (OR) with corresponding 95% confidence intervals (95% CI) were calculated to estimate the strength of associations.

A two-tailed p-value of less than 0.05 was considered statistically significant.
Given the limited sample size, multivariable regression analysis was not performed to avoid unstable estimates and overfitting of the data.

RESULTS
A total of 25 female survivors of alleged sexual assault examined under the provisions of the POCSO Act fulfilled the eligibility criteria and were included in the study.

Sociodemographic Characteristics
The majority of survivors belonged to the 11–15-year age group (56.0%), followed by those older than 15 years (24.0%). Only one survivor (4.0%) was younger than five years of age. Most survivors were students (68.0%), unmarried (88.0%), and belonged to upper-lower socioeconomic class families (44.0%).

Table 1. Sociodemographic Profile of the Survivors (n = 25)

Variable	Category	Frequency (n)	Percentage (%)
Age group (years)	≤5	1	4.0
	6–10	4	16.0
	11–15	14	56.0
	>15	6	24.0
Marital status	Unmarried	22	88.0
	Married	3	12.0
Occupation	Student	17	68.0
	Homemaker	3	12.0
	Others	5	20.0
Socioeconomic status	Upper-lower	11	44.0
	Lower-middle	7	28.0
	Lower	5	20.0
	Upper-middle	2	8.0

Assault Characteristics

The accused was known to the survivor in the majority of cases (84.0%). Boyfriends constituted the commonest category of alleged perpetrators (36.0%). The alleged incidents most frequently occurred either at the survivor's residence (28.0%) or in premises associated with the accused (20.0%). Elopement with boyfriend was the most commonly reported circumstance preceding the medico-legal examination (36.0%).

Table 2. Assault-related Characteristics of the Cases (n = 25)

Variable	Category	Frequency (n)	Percentage (%)
Relationship with accused	Known	21	84.0
	Unknown	4	16.0
Type of accused	Boyfriend	9	36.0
	Relative	4	16.0
	Neighbour	3	12.0
	Acquaintance	5	20.0
	Stranger	4	16.0
Place of occurrence	Survivor's residence	7	28.0
	Accused's premises	5	20.0
	Other locations	13	52.0
Circumstance reported	Elopement with boyfriend	9	36.0
	Forced sexual assault	8	32.0
	Other circumstances	8	32.0

Pattern of Injury Detection

Genital injuries were identified in 22 survivors (88.0%). Extra-genital injuries were documented in only three cases (12.0%). Three survivors (12.0%) demonstrated no demonstrable physical injuries.

Old healed hymenal tears constituted the commonest genital finding, observed in 13 survivors (52.0%), followed by recent hymenal tears in eight survivors (32.0%). Four survivors (16.0%) had an intact hymen.

Table 3. Distribution of Injury Findings (n = 25)

Injury Variable	Category	Frequency (n)	Percentage (%)
Genital injury	Present	22	88.0
	Absent	3	12.0
Extra-genital injury	Present	3	12.0

Injury Variable	Category	Frequency (n)	Percentage (%)
	Absent	22	88.0
Hymenal findings	Old healed tear	13	52.0
	Recent tear	8	32.0
	Intact hymen	4	16.0
Overall injury status	Genital only	19	76.0
	Genital + extra-genital	3	12.0
	No injuries detected	3	12.0

Reporting Interval and Injury Detection

Fifteen survivors (60.0%) underwent medico-legal examination within five days of the alleged incident, whereas eight survivors (32.0%) presented more than fifteen days after the incident.

Children aged ten years or younger demonstrated higher odds of reporting within four days of the alleged assault compared with older survivors (OR = 1.5). However, this association did not achieve statistical significance (p = 0.689).

Relationship with Accused and Injury Pattern

Old healed hymenal tears were more frequently observed among survivors assaulted by known individuals (59.2%), whereas recent hymenal tears were relatively more common among those assaulted by unknown perpetrators.

Although this association did not attain statistical significance (Fisher's exact test, p = 0.117), the observed trend suggests differences in assault dynamics between known and unknown assailants.

Table 4. Relationship Between Survivor–Accused Relationship and Hymenal Findings

Hymenal Finding	Known Accused n (%)	Unknown Accused n (%)	p-value
Old healed tear	13 (59.2)	0 (0.0)	
Recent tear	5 (22.7)	3 (75.0)	
Intact hymen	3 (13.6)	1 (25.0)	0.117*

* Fisher's exact test.

Age Dynamics of Survivor and Accused

A negative correlation was observed between survivor age and accused age, indicating that younger survivors tended to be associated with relatively older accused persons. However, this association did not reach statistical significance and should be interpreted cautiously in view of the limited sample size.

DISCUSSION

In our cohort, injury detection appeared to be influenced by several interacting factors, including the timing of examination, the survivor–accused relationship, and the circumstances surrounding the alleged assault. The findings demonstrate that injury detection following child sexual abuse is influenced by multiple factors, including reporting interval, survivor–accused relationship, and the circumstances surrounding the assault. Equally important, the study reinforces the fundamental medico-legal principle that the absence of demonstrable injuries does not negate the occurrence of sexual assault.[4,5,11,12]

More than half of the survivors examined were between 11 and 15 years of age, a pattern that mirrors observations from Indian surveillance data and previous studies. Similar age distributions have been reported in several Indian studies, reflecting the heightened vulnerability of adolescents to sexual victimization.[13] Adolescence is often associated with increased independence, expanding social interactions, emotional susceptibility, and exploratory relationships, all of which may contribute to increased exposure to abusive situations. However, the interpretation of these findings should remain cautious, as sociocultural factors and reporting practices may also influence observed age patterns.

One of the striking findings was that most survivors identified someone already known to them as the alleged perpetrator. The majority of survivors identified individuals familiar to them, with boyfriend relationships constituting the largest subgroup. This finding is consistent with contemporary POCSO literature demonstrating that child sexual abuse frequently occurs within existing social networks rather than through stranger assaults.[13] Familiar perpetrators often exploit trust, emotional dependency, authority, or grooming behaviours, thereby reducing overt resistance and delaying disclosure.

Healed hymenal tears were encountered more often than acute tears, suggesting that delayed disclosure or repeated exposure may have contributed to the pattern observed. These findings were more commonly observed among survivors assaulted by known individuals, whereas recent hymenal tears appeared relatively more frequent in assaults involving unknown perpetrators. Although the observed association did not attain statistical significance, it suggests possible

differences in assault dynamics. Repeated exposure, delayed disclosure, and ongoing abusive relationships may account for the predominance of healed findings among known-perpetrator assaults.[4,5]

Timely medico-legal examination remains one of the most important determinants of injury detection. Sixty percent of survivors in the present study underwent examination within five days of the alleged incident, whereas a substantial proportion presented after prolonged intervals. Delayed presentation significantly limits the ability to identify acute genital injuries and recover biological evidence because genital tissues possess remarkable healing potential.[7,8] Previous studies have consistently demonstrated that mucosal injuries heal rapidly and may become undetectable within days. Consequently, the absence of fresh injuries in delayed presentations should not be interpreted as evidence against the allegation o f abuse. Another noteworthy observation was the relative scarcity of extra-genital injuries despite a high frequency of genital findings. Extra-genital injuries were documented in only a minority of survivors. Such injuries generally reflect overt force, physical restraint, or active resistance. Their absence, however, should not be misconstrued as proof of consent, fabrication, or absence of assault. Many children submit because of fear, threats, psychological coercion, manipulation, or the influence exerted by trusted individuals. In such circumstances, external injuries may be entirely absent despite the occurrence of sexual abuse.[9,10]

An intact hymen was documented in a proportion of survivors. This observation reiterates an established principle in forensic medicine: hymenal integrity neither confirms nor excludes sexual assault. Variations in hymenal anatomy, elasticity of genital tissues, non-penetrative forms of abuse, and healing of previous injuries contribute to the wide spectrum of examination findings. Therefore, medico-legal opinions should never rely solely upon hymenal status but should integrate history, behavioural indicators, laboratory evidence, and the overall clinical context.[4,5,11,12]

Although not statistically significant, younger survivors in our series tended to be associated with relatively older accused individuals. This trend warrants further exploration in larger studies. Younger children may be particularly susceptible to manipulation by older perpetrators because of emotional dependence, limited understanding of abusive behaviours, and reduced capacity to disclose inappropriate acts promptly. While the present sample size precludes definitive conclusions, this finding merits further exploration in larger multicentric studies.

Medico-legal Implications

From a medico-legal perspective, these findings carry important implications for clinicians, investigators, and courts:

1. The absence of physical injuries does not exclude the possibility of sexual assault.
2. Delayed reporting substantially reduces the likelihood of detecting acute injuries and biological evidence.
3. Known-perpetrator assaults may be associated with healed rather than fresh genital findings because of repeated exposure and delayed disclosure.
4. Extra-genital injuries are uncommon and should not be expected in every case of child sexual abuse.
5. Comprehensive history-taking and meticulous documentation remain indispensable components of medico-legal evaluation.

These principles assume particular importance during courtroom testimony, where misconceptions regarding expected injury patterns continue to influence legal interpretation.[4,5,11]

Strengths

The present study focused specifically on determinants of injury detection rather than merely describing demographic characteristics of survivors. It incorporated both survivor-related and assault-related variables and examined their potential influence on medico-legal findings. The use of real-world tertiary care forensic data enhances the practical applicability of the observations.

Limitations

Certain limitations should be acknowledged. The study was retrospective in nature and relied upon the completeness and accuracy of medico-legal records. The relatively small sample size inevitably limited the statistical power of the study and may have obscured weaker associations. Colposcopic examination and photographic documentation were not uniformly available, potentially limiting the detection of subtle genital findings. Additionally, the findings represent the experience of a single tertiary care centre and may not be generalisable to other settings.

Future multicentric studies with larger cohorts and standardized examination protocols would help clarify these observations and strengthen the evidence base in this area.

CONCLUSION

Injury detection among female survivors examined under the POCSO Act is shaped by multiple factors, particularly the timing of examination and the nature of the survivor–accused relationship. Genital findings are more frequently documented than extra-genital injuries, while healed hymenal tears predominate in many cases involving known perpetrators. Perhaps the most important message from this study is that the absence of physical findings should never be taken as evidence that sexual assault did not occur. Prompt reporting, careful forensic evaluation, and thoughtful

interpretation of findings in the context of the survivor's history remain essential for delivering accurate medico-legal opinions and ensuring justice for affected children.

FUNDING
No external funding was received for this study.

CONFLICT OF INTEREST
The authors declare that they have no competing interests.

REFERENCES

1. World Health Organization. Violence against children. Geneva: World Health Organization; 2025 [cited 2026 Jun 12]. Available from: https://www.who.int/news-room/fact-sheets/detail/violence-against-children
2. The Protection of Children from Sexual Offences Act, 2012. Act No. 32 of 2012. New Delhi: Government of India; 2012. Available from: https://www.indiacode.nic.in
3. Ministry of Health and Family Welfare, Government of India. Guidelines and protocols: medico-legal care for survivors/victims of sexual violence. New Delhi: MoHFW; 2014.
4. Adams JA, Farst KJ, Kellogg ND. Interpretation of medical findings in suspected child sexual abuse: an update for 2018. J Pediatr Adolesc Gynecol. 2018;31(3):225–231.
5. Kellogg ND, Parrish R, Anderst JD. Interpretation of medical findings in suspected child sexual abuse: an update for 2023. Child Abuse Negl. 2023;142:106255.
6. Berger P, Reiser E, Rittmannsberger D, et al. Physical examination in child sexual abuse: approaches and current evidence. Dtsch Arztebl Int. 2023;120(24):415–422.
7. Wood GJ, Furey A, O'Connell CD, et al. The optimal timing of forensic evidence collection following paediatric sexual assault. J Forensic Leg Med. 2023;94:102461.
8. Adams JA. Medical evaluation of suspected child sexual abuse. J Pediatr Adolesc Gynecol. 2011;24(6):313–319.
9. Heger A, Ticson L, Velasquez O, Bernier R. Children referred for possible sexual abuse: medical findings in 2384 children. Child Abuse Negl. 2002;26(6–7):645–659.
10. Maguire S, Goodall E, Moore T. Association between physical signs and child sexual abuse: a systematic review. Arch Dis Child. 2009;94(11):860–867.
11. Royal College of Paediatrics and Child Health. The Physical Signs of Child Sexual Abuse: An Evidence-Based Review and Guidance for Best Practice. London: RCPCH; 2015.
12. Kellogg ND; American Academy of Pediatrics Committee on Child Abuse and Neglect. The evaluation of sexual abuse in children. Pediatrics. 2005;116(2):506–512.
13. National Crime Records Bureau. Crime in India 2023: Crimes Against Children. New Delhi: Ministry of Home Affairs, Government of India; 2024.
14. World Health Organization. Responding to children and adolescents who have been sexually abused: WHO clinical guidelines. Geneva: WHO; 2017.
15. Ministry of Women and Child Development, Government of India. Handbook on POCSO Act and Rules. New Delhi: MWCD; 2020.