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Overlooked and overexposed: a comparison of pregnancy outcomes in incestuous and non-incestuous sexual violence

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Abstract

Background One of the gravest consequences of sexual violence is pregnancy. This study aimed to determine the risk groups of sexual violence-related pregnancies and investigate the influence of intra- and extrafamilial sexual violence's different dynamics on pregnancies.

Methods This study used a sample of 986 sexual violence cases and particularly 18 pregnancies resulting from these between 2013 and 2022 in Eskişehir, Türkiye. After categorizing the cases into two groups as incestuous or non-incestuous, descriptive, comparative, and correlational analyses were retrospectively employed across multiple parameters, including age groups, victim and perpetrator characteristics, assault features, and pregnancy outcomes.

Results The incestuous group ($n=97$) exhibited higher rates of child victimization ($p<0.001$) and a greater likelihood of pregnancy within the sample of reported sexual violence cases (14 times higher than the non-incestuous group, $n=889$, $p<0.001$). Compared to the non-incestuous pregnancy cohort ($n=7$), incestuous pregnancy cohort ($n=11$) displayed earlier onset ($p=0.009$), longer duration ($p=0.002$), and greater chronic exposure to physical violence ($p=0.038$). Regardless of incest, minors and young adults with intellectual disabilities were particularly vulnerable to pregnancy from sexual violence. Pregnancies were often detected beyond the national on-request abortion limit (10 weeks vs. 15.3 weeks average). Family members reported incestuous pregnancies less frequently; instead, teachers and physicians were key reporters. Findings suggested a more prevalent tendency in the study sample to conceal incestuous pregnancies in smaller settlements, as compared to cities.

Conclusions The results suggested a heightened likelihood of pregnancy among vulnerable populations exposed to sexual violence, particularly in incestuous cases where the abuse follows prolonged and concealed patterns.

Recommendations Legal frameworks should prioritize the physical and psychological well-being of sexual violence victims and ensure timely access for vulnerable populations to reproductive healthcare, including abortion services, as well as comprehensive medical, psychosocial, and long-term support. Targeted prevention strategies, public awareness campaigns, and educational programs should be implemented to highlight the unique vulnerabilities of incest victims, particularly children and individuals with intellectual disabilities. Such policy initiatives must consider the distinct characteristics and risk factors of incestuous and non-incestuous sexual violence.

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Keywords Sexual violence, Sexual abuse, Incestuous, Non-incestuous, Pregnancy

Background

Sexual violence can manifest in various forms, including sexual assault and sexual abuse, which are primarily differentiated based on the victim's age and/or capacity to give consent [1, 2]. Since this study encompasses all sexual violence-related pregnancies involving children, adults, and individuals incapable of giving consent, the term "sexual violence" will be used as an umbrella term to refer to both sexual assault and sexual abuse, where appropriate, throughout the article.

Regardless of distinctions based on consent, sexual violence has devastating consequences, ranging from physical and mental health disorders to social adjustment difficulties and severe psychiatric illnesses, affecting not only adults but also children and individuals unable to provide consent [3–8]. According to the report of WHO on violence against women, it is estimated that approximately one in three women has experienced either physical and/or sexual intimate partner violence or non-partner sexual violence in their lifetime [9]. The Turkish Statistical Institute's gender statistics for 2022 reported that the lifetime prevalence of exposure to sexual violence was 12% nationwide, while it was 9.9% in Central Anatolia, where the study was conducted [10]. On the other hand, no comprehensive study has been published on the overall prevalence of incest in Turkey; however, research on sexual crimes conducted in various Turkish provinces has reported rates ranging from 4% to 35.6% [11–15].

One of the gravest results of sexual violence is pregnancy, particularly among minors. In such cases, both the mother and the offspring may experience numerous life-threatening complications during the acute phase, including eclampsia, obstetric hemorrhage, placental abruption, preterm birth, low birth weight, and severe psychological distress such as acute stress reactions and suicidal ideation [16–19]. The chronic consequences for the mother extend into enduring mental health disorders such as depression, post-traumatic stress disorder, and anxiety, as well as social stigma, educational disruption, and long-term physical health problems [20, 21]. Similarly, children born as a result of sexual violence are at increased risk of psychological difficulties and developmental delays due to both biological and environmental factors [20, 22, 23].

Sexual relations between relatives closer than a certain degree are considered taboo in most cultures and societies [24, 25]. Such relations are described by the term 'incest,' derived from the Latin word in-castus (meaning 'not chaste' or 'unchastity'; Middle English: incest) [26]. In contemporary usage, incest is broadly defined as a marital, sexual, or erotic relationship occurring between individuals who are close family members [27, 28]. However, the boundaries of this definition (particularly with respect to step-relations, adoption, and caregiving) vary across legal and cultural contexts. Modern studies and legal codes often extend the concept of incest beyond biological ties to include step-relationships, adoptive families, and caregiving roles [29, 30]. In Turkish law, incest is likewise interpreted to encompass such relationships, and, as detailed in the Methods section, the present study also includes step-relations, adoptive ties, and caregiving roles within the scope of incest; sexual relations falling outside this scope are considered non-incestuous in the study.

Although definitions and socio-legal norms vary across countries and cultures, the specific characteristics and circumstances of incestuous and non-incestuous sexual violence may provide critical insights into patterns of offending, the violation process, its severity, and its long-term consequences. For instance, incestuous sexual violence often takes place in seemingly safe and isolated environments, such as the home, where children spend a significant portion of their early years [31], and is typically perpetrated by a familiar and trusted individual [32]. These circumstances may facilitate its earlier onset, longer duration, higher frequency, remaining undisclosed, escalation into more complex forms of abuse, and ultimately more severe physical and psychological harm [12, 13, 31, 33–35]. Indeed, several studies have compared incestuous and non-incestuous sexual abuse and generally concluded that incestuous abuse is associated with early onset, longer duration, higher frequency, greater severity, poorer health outcomes, and delayed disclosure [31, 35–40]. These characteristics of incestuous sexual violence may contribute to a higher risk of pregnancy. In addition, the earlier onset of abuse in incestuous relationships may be attributed not only to the fact that younger children spend more time at home but also to their still-developing awareness, which makes their trust more easily exploitable [25, 41]. Consequently, the proportion of child victims tends to be higher in incestuous cases. In fact, a U.S. Department of Justice report indicated that in 26.7% of sexual assaults, the perpetrator was a family member. This figure rose to 34.2% when the victims were children, based on data from 12 states collected between 1991 and 1996 [42].

The aforementioned studies primarily reflect data from the general population of sexual violence cases rather than pregnancies resulting from sexual violence. Two studies conducted in Brazil, however, specifically focusing on pregnancies resulting from sexual violence, found

that victims of incest tend to be younger and have more advanced gestational development due to delayed presentation [32, 43]. The present study similarly focuses on pregnancies, aiming to explore how the distinct nature of incestuous and non-incestuous sexual violence influences the characteristics and consequences of resulting pregnancies by analyzing age groups, victim and perpetrator profiles, assault features, and pregnancy outcomes. Understanding the nature of incestuous and non-incestuous incidents as two of the key determinants within the social context can be helpful to prevent such violent acts and mitigate their negative consequences [44].

In conclusion, pregnancy represents one of the most serious and tangible consequences of sexual violence. While the majority of the literature addresses sexual violence in the overall victim population, the impact of the specific characteristics of incestuous and non-incestuous violence on resulting pregnancies remains underexplored. Understanding these effects will shed light on the dynamics of how these pregnancies occur and provide insight into the necessary precautions; therefore, this study focused specifically on the pregnancy group.

Building on the existing data regarding the characteristics of incestuous and non-incestuous sexual violence, we therefore proposed the following hypotheses:

- Incestuous sexual violence is associated with (1) a higher proportion of child victims and (2) a greater risk of pregnancy compared to non-incestuous sexual violence.
- In pregnancies resulting from incestuous sexual violence, the assaults show (3) earlier onset, (4) longer duration, and (5) higher frequency compared to those resulting from non-incestuous sexual violence.

Methods

Setting

This single-center study was conducted in Eskişehir, a city located in the northwestern part of Central Anatolia, Turkey. Turkey has a population of approximately 85 million, with a high rate of urbanization and regional diversity in terms of socioeconomic status, cultural traditions, and religious practices. While fertility rates have declined in recent decades, family structures and gender roles continue to be influenced by cultural and religious norms, which may shape societal attitudes toward sexual violence and incestuous relationships. On the other hand, Eskişehir has a population of around 900,000, with the majority residing in urban areas. The city is considered one of the more socio-economically developed provinces of Turkey, with a diversified economy based on industry, services, and higher education. It is home to three major universities, leading to a relatively young and highly educated population compared to national averages. Culturally, Eskişehir combines traditional Anatolian family values with more modern and urbanized lifestyles, partly due to its large student population and industrial development. Religious practices are present but often expressed in a more moderate form than in certain other regions of Turkey.

Study sample

The study retrospectively reviewed cases of sexual violence referred by judicial authorities to the Department of Forensic Medicine, Faculty of Medicine, Eskişehir Osmangazi University, between 2013 and 2022. This department functions as the primary referral center in Eskişehir, where nearly all sexual assault examinations are conducted. The timeframe was determined on the grounds of data availability and methodological consistency: Since pregnancies resulting from sexual assault are relatively rare, a ten-year study window (2013–2022) was selected. As this study was retrospective, 2013 was chosen as the start year because it was the first year from which complete and consistently retrievable screening and medical record data were available. Male victims of sexual violence were excluded from the study. A total of 986 female victims were analyzed in terms of age (child vs. adult) and whether incestuous or not. Then, the cases that resulted in pregnancies were classified as incestuous and non-incestuous and underwent further analysis (Fig. 1). Given that the study examined pregnancies, all involved individuals (both victims and perpetrators) were at least pubescent; consequently, all victims were biologically female, and all perpetrators were biologically male.

Data collection and coding

The study's data were obtained from the case's medical files and the judicial files sent by the public prosecutor's office. One of the authors, a forensic medicine specialist in the same department, collected and coded the data. To ensure confidentiality, each case was assigned a numerical code, and the data were recorded in an SPSS file. All data were stored securely on the computer of the researcher who collected them, with no personal identifiers included at any stage.

Ethical consideration

The study protocol was approved by the Non-Interventional Clinical Research Board of Eskişehir Osmangazi University. Informed consent was not required in accordance with Turkish national regulations and institutional policies, as no identifiable personal data were used.

Definitions and classifications

Since the study was conducted in Turkey, the categorization of incestuous cases was based on the explanation

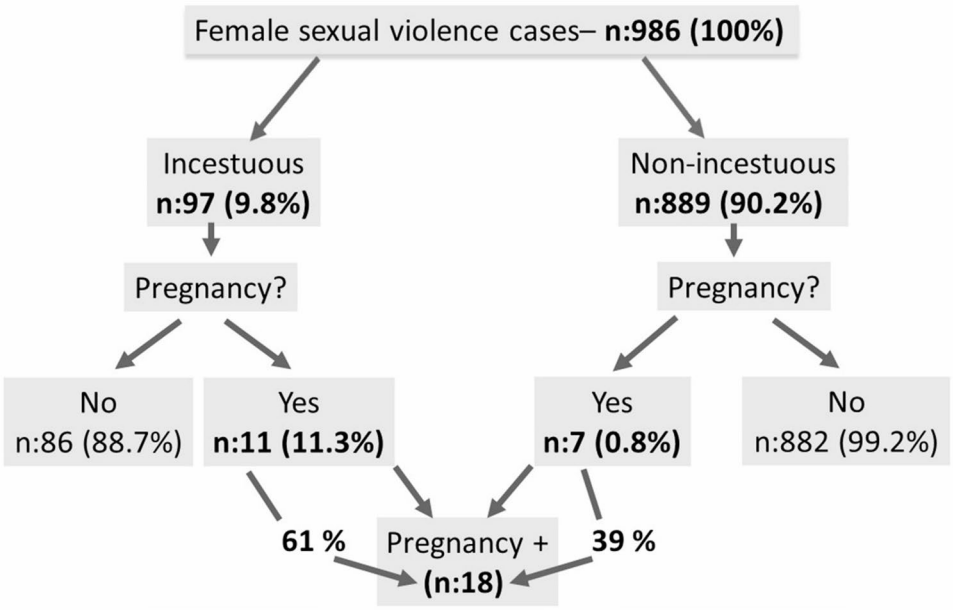


Fig. 1 Study design scheme with case numbers and percentages

provided in Articles 102 and 103 of the Turkish Penal Code [45], which refer to 'a person of third-degree blood relation or kinship, or a stepfather, stepmother, half-sibling, adopter, or adopted child.' Thus, cases in which the perpetrator was found to be a family member or a person living in the same house responsible for the domiciliary care and supervision of the victim, even if there is no blood relation, were evaluated within the scope of incestuous. Namely, sexual relations involving a (step) father, (step)mother, (step)daughter, (step)son, (step) uncle, (step)aunt, (step)niece, or individuals residing in the same household who were responsible for care were classified within the incestuous subgroup. Cases other than those relations (e.g., classmate or neighbor) were categorized in the non-incestuous subgroup of the study sample.

The incestuous (IP) and non-incestuous (n-IP) pregnancy groups were examined in terms of the following parameters:

- Demographic characteristics of the victims, families, and perpetrators,
- Kinship or relationship between the victim and the perpetrator,
- Age at onset of sexual victimization,
- Duration and frequency of the sexual assault,
- Exposure to physical violence,
- Reporter of the sexual assault,
- Gestational week at the time of pregnancy detection,
- Pregnancy outcome (termination or birth).

Statistical analysis

The data were recorded and statistically analyzed using SPSS 25 package statistical software (IBM SPSS Inc., Chicago, IL, USA). Descriptive statistics were presented as mean ± standard deviation. The proportions of the analyzed parameters were presented as percentages using cross-tabulations for categorical variables to compare the total incestuous and non-incestuous cases, as well as the IP and n-IP groups. The chi-square test or Fisher's exact test (when chi-square test assumptions do not hold due to low expected cell counts), where appropriate, was used to compare these proportions in different groups. Due to the insufficient sample size in the pregnancy subgroup, the data did not meet the adequacy criteria for parametric tests; therefore, the Mann–Whitney U test was used to compare numerical variables between independent groups. The correlation coefficients and their significance were calculated using the Spearman test. A *p-value* of less than 0.05 was considered statistically significant.

Results

Prevalence: type of sexual violence, child victimization, and pregnancy

In ten years, 986 cases of sexual violence against women have been examined in the center. Of these, 97 (9.8%) were incestuous cases, and 889 (90.2%) were non-incestuous cases. In incestuous cases, the child (< 18 years) victim rate was found to be significantly higher than in non-incestuous cases (93.8% and 50.7%, respectively; $p < 0.001$). The pregnancy rate was also significantly (14 times) higher in incestuous cases compared to

non-incestuous cases, in our sample of reported sexual violence. (11.3% vs. 0.8%) ($p < 0.001$) (Fig. 2).

Additionally, since the rate of pregnancy occurrence in incestuous cases was above 10% and below 1% in non-incestuous cases, incestuous cases accounted for 61% of all pregnancies resulting from sexual violence (Fig. 1).

Sociodemographic variables

There was no age difference between the incestuous pregnancy (IP) and non-incestuous pregnancy (n-IP) groups (17.3 ± 2.1 and 18.4 ± 3.7, respectively; $p = 0.783$). The mean duration of education was 7.7 years in both groups. There were no university students or graduates in either group. Although there was no significant difference, the number of siblings tended to be higher in the IP group compared to the n-IP group (2.1 and 1.4, respectively). Family unity (IP = 27.3%, n-IP = 42.9%) and income (IP = low, n-IP = low-medium) were low in both groups; however, they tended to be lower in the IP group. Especially in all IP cases, family income was at or below the country's minimum wage. In the IP group, there were no university students or graduates in the family, and the mean parental educational duration was 7.3 ± 1.6 years, while in the n-IP group, there were, and the mean parental educational duration was 8.3 ± 4.8 years (Table 1). Additionally, 63.6% of IP victims and 71.4% of n-IP victims lived in the provincial-district center; the rest lived in towns and villages (Supplementary Table).

Offense characteristics (duration, frequency, physical violence, reporting patterns)

The duration of sexual assault was significantly higher in the IP group than in the n-IP group ($p = 0.002$), with a mean of 32.7 months (1–7 years) and a mean of 6.1 months (0–1 year), respectively. Although the number of sexual assaults was approximately twice as much in the IP group (IP:15.3, n-IP:7.1), there was no significant difference ($p = 0.165$) between the groups (Table 1). In

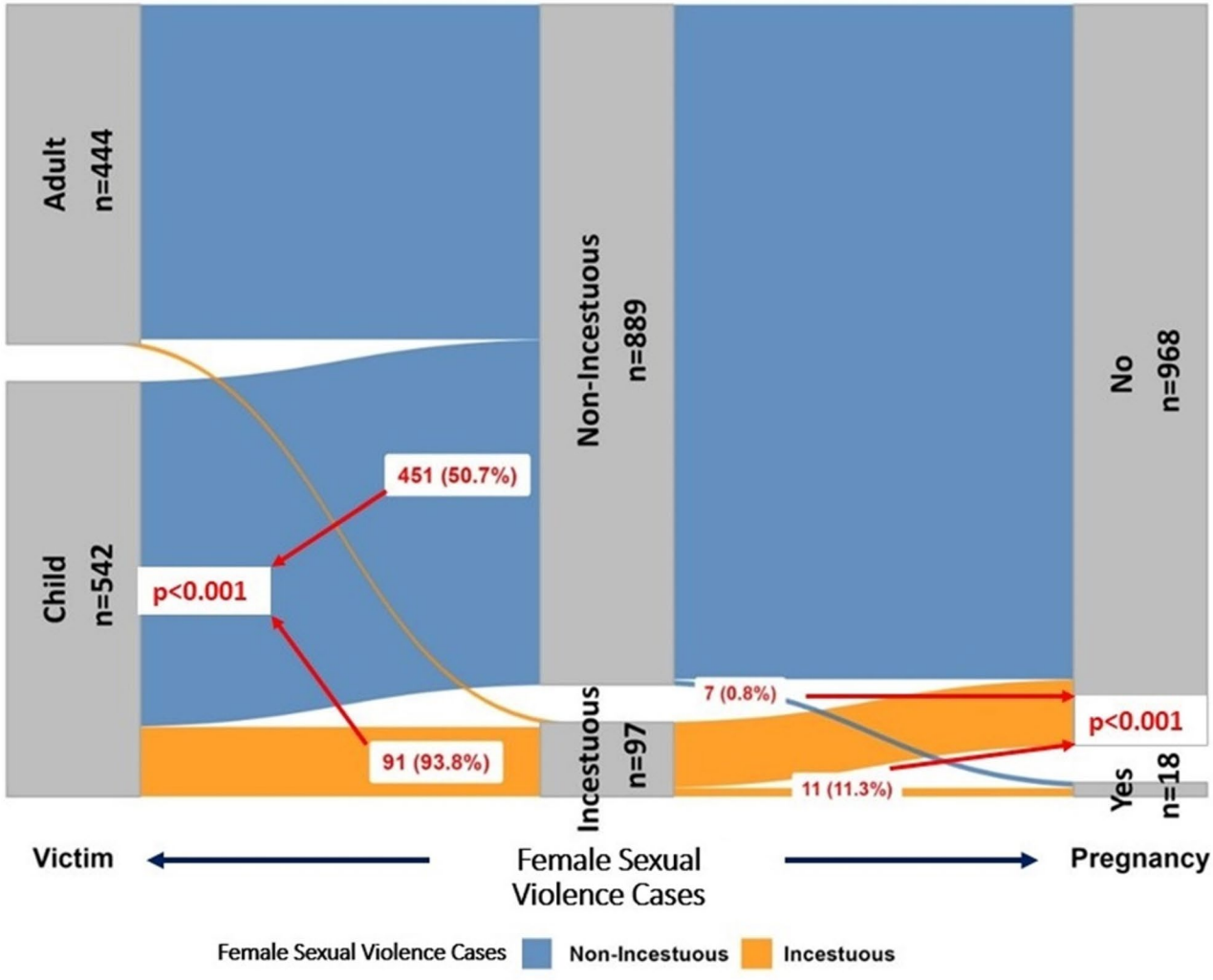


Fig. 2 Comparison of incestuous and non-incestuous female sexual violence cases according to the victim's age group and pregnancy rate

Table 1 Comparison of incestuous (IP) and non-incestuous (n-IP) sexual violence that resulted in pregnancy

	IP cases (*n*:11)	*n*-IP cases (*n*:7)	*p**
Age	17.3 ± 2.1	18.4 ± 3.7	0.783
Sexual assault onset age	14.6 ± 0.8	18.1 ± 3.9	**0.009**
Teenage pregnancy	9 (81.8%)	5 (71.4%)	> 0.999
Teenage + ID** pregnancy	11 (100.0%)	7 (100.0%)	> 0.999
Victims' educational duration	7.7 ± 4.1	7.7 ± 4.3	0.854
Number of siblings	2.1 (1–5)	1.4 (0–3)	0.422
Family unity	3 (27.3%)	3 (42.9%)	0.627
Family income	Low (all cases)	Low-medium (5 – 2)	0.137
Parental educational duration	7.3 ± 1.6	8.3 ± 4.8	0.740
Mental/psychiatric illness	2 (18.2%)	2 (28.6%)	> 0.999
Sexual assault duration	32.7 months (12–84)	6.1 months (0–12)	**0.002**
Sexual assault number	15.3 (5–100)	7.1 (2–20)	0.165
Physical violence	6 (54.5%)	0 (0.0%)	**0.038**
Week of pregnancy	15.3 ± 5.4 (8–26)	15.3 ± 6.5 (7–23)	0.964
Termination	9 (81.8%)	5 (71.4%)	> 0.999
Notifier (family)	4 (36.4%)	4 (57.1%)	0.630

*$p < 0.05$ (Bold values indicate statistically significant results)

**Individuals with intellectual disabilities

addition, the sexual assaults were multiple (minimum 2) in all cases in the study (Supplementary Table). Neither the IP nor the n-IP group had histories or examination findings indicating concurrent acute physical violence. However, while no instances of chronic exposure to physical violence were observed in the n-IP group, more than half of the IP group reported such exposure; therefore, it was significantly more common in the IP group ($p = 0.038$). Although there was no significant difference, the rate of reporting sexual assault by a family member was lower in the IP group compared to the n-IP group (36.4% and 57.1%, respectively) (Table 1). Interestingly, no case in the IP group was reported by the first or second-degree relative of the perpetrator (Supplementary Table). In support of this, in two cases (the perpetrator was the father in one and the brother in the other), the mother confessed that she remained silent, although she knew about the sexual assault. Instead of the family members, teachers (36.4%) and physicians (27.3%) stood out as the prominent reporters of the assaults in the IP group (Supplementary Table).

Victim characteristics and pregnancy outcomes (age at onset, disabilities, gestational age at detection, termination vs. delivery)

The age at sexual assault onset was significantly lower in IP cases (14.6 ± 0.8) than in non-IP cases (18.1 ± 3.9) ($p = 0.009$). Adolescent pregnancies accounted for approximately three-quarters of all pregnancies in both groups. When adolescents and individuals with intellectual disabilities were considered together under the category of vulnerable groups, they accounted for all pregnancies (100%) in both the IP and non-IP groups (Table 1). All four cases over 20 years were victims with intellectual disabilities (2 in each group), and there were no victims with intellectual disabilities under 20 (Supplementary Table).

The mean gestational week at detection was 15.3 weeks in both groups. Pregnancy was terminated in 9 cases in the IP group and 5 cases in the n-IP group, whereas 2 cases in each group resulted in delivery because the legal termination limit of 20 weeks for sexual assaults in the country was exceeded (Table 1). Additionally, a significant, strong negative correlation ($p = 0.009$, $r = -0.743$) was found between educational duration and the gestational week at the time of pregnancy detection in the IP group (Fig. 3). However, no such correlation was observed in the n-IP group.

In the IP group, individuals living in the town and village (median: 20.5 weeks) showed significantly later pregnancy detection and reporting compared to those living in the city (median: 13 weeks) ($p = 0.029$). Also, those living in town and village, incestuous pregnancies (median: 20.5 weeks) were detected later than non-incestuous pregnancies (median: 11.5 weeks); however, this difference did not reach statistical significance due to the low number of cases ($p = 0.165$) (Table 2).

Perpetrator characteristics

The perpetrator was a known person to the victim 100% in both groups. He was the father in 3 (27.3%), brother in 3 (27.3%), paternal uncle in 2 (18.2%), maternal uncle in 2 (18.2%), and stepfather in 1 (9.0%) of the IP cases. Whereas a neighbor in 3 (42.8%), boyfriend in 3 (42.8%), and classmate in 1 (14.4%) of the n-IP cases (Fig. 4 and Supplementary Table). None of the IP and n-IP cases had more than one perpetrator.

There were no significant differences in perpetrator demographics (age, educational duration, marital status, and working status) between the IP and n-IP groups (Table 3).

Discussion

This study compared reported incestuous and non-incestuous sexual violence cases, including the pregnancies resulting from them, and found (1) a significantly higher proportion of child victims and (2) a significantly greater likelihood of pregnancy among the incestuous cases. Incestuous pregnancies, in particular, were characterized by (3) earlier onset and (4) longer duration of sexual assault. Although the incestuous pregnancy group exhibited (5) a higher frequency of sexual assault, this difference did not reach statistical significance.

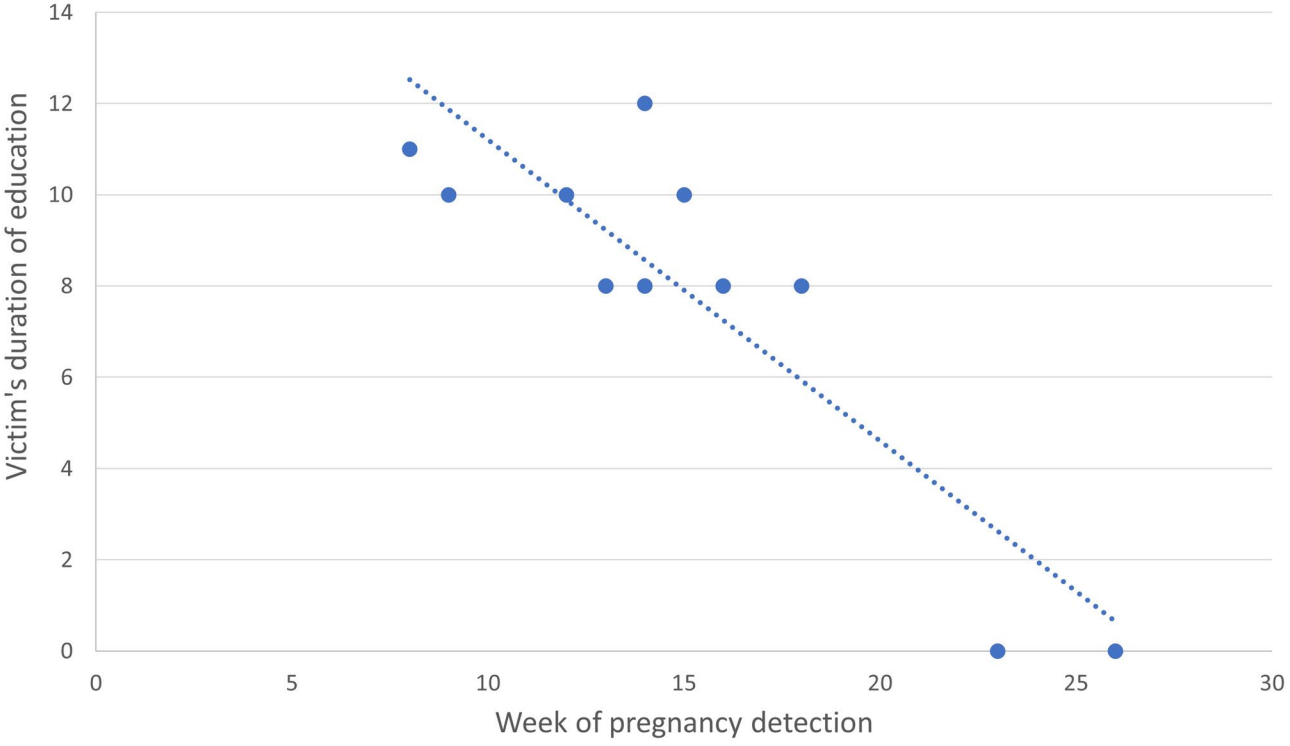


Fig. 3 Association between the victim's educational duration and gestational age at pregnancy detection in incestuous cases

Table 2 Comparison of gestational week at detection according to the type of sexual violence and the place of residence

Gestational week at detection	Town and village (*n*: 6) median (IQR)	City center (*n*: 12) median (IQR)	*p**
Incestuous (n: 11)	20.5 (15.0–25.3.0.3)	13.0 (9.0–15.0)	**0.029**
Non incestuous (n: 7)	11.5 (8.0–15.0)	18.0 (10.0–23.0)	0.434
p*	0.165	0.254	

*$p < 0.05$ (Bold value indicates a statistically significant result)

Additionally, the incestuous pregnancy group also showed higher rates of chronic exposure to physical violence. Regardless of whether the assault was incestuous, children and individuals with intellectual disabilities in the study cohort were found to have a higher likelihood of pregnancy, with most cases being identified beyond the country's legal limit for on-request abortion. Furthermore, in incestuous pregnancies, a strong negative correlation was observed between the victim's educational duration and gestational age at detection. Some findings also suggest that families may be less inclined to report incestuous abuse and that there may be a more prevalent tendency to conceal incestuous pregnancies in smaller settlements compared to cities. However, given the limited sample size of pregnancies resulting from sexual violence, these findings should be interpreted with caution and validated through larger-scale research.

In our study population, incest accounted for approximately one-tenth (9.8%) of all sexual assault cases. The literature states that it is difficult to verify its global prevalence due to varying definitions of incest and differing study methodologies [29, 33, 46]. However, 17 local studies published since 2005, conducted in various countries, reported incest prevalence rates ranging from 4% to 61.6% among sexual assault cases [11–15, 31, 33, 34, 37, 47–54]. Although these rates vary widely, lower figures in some regions are often attributed to underreporting [55, 56]. Supporting this, Russell's survey of 930 women in San Francisco revealed that only 2% of incest cases had been reported to authorities [57]. In fact, one study reported that all identified incest cases had come to light solely through the detection of pregnancies [12].

The results demonstrated a significantly higher proportion of child victims in incestuous sexual violence (93.8%) compared to non-incestuous ones (50.7%). Although incestuous sexual violence can onset in or persist into adulthood, it predominantly concerns childhood and adolescence, as generally reported in the literature [43, 58, 59]. Additionally, an analysis of all cases resulting in pregnancy, both within the incestuous (IP) and non-incestuous (n-IP) groups, showed that nearly all victims were adolescents, with the remaining being young adults with intellectual disabilities. These findings underscore the heightened vulnerability of minors and young adults

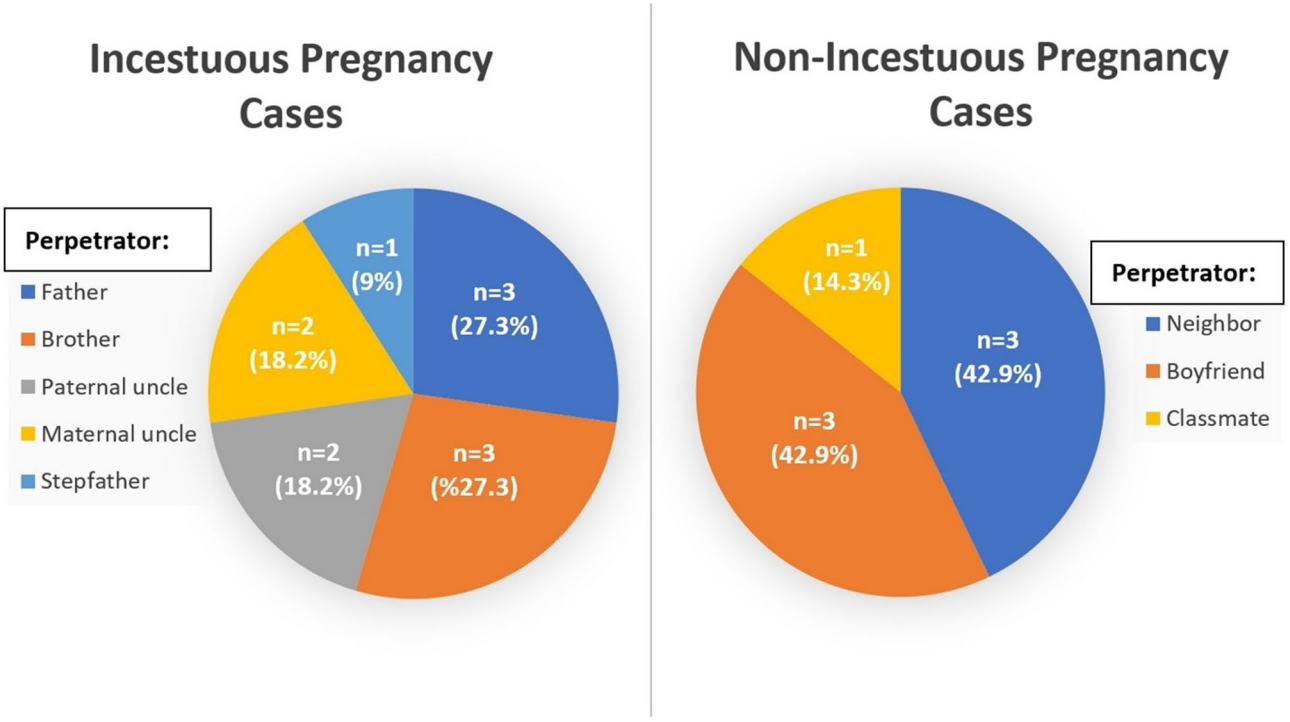


Fig. 4 Victim-perpetrator relation of incestuous and non-incestuous pregnancy cases

Table 3 The demographics of the perpetrators in the incestuous (IP) and non-incestuous (n-IP) pregnancies

	IP cases (*n*:11)	*n*-IP cases (*n*:7)	*p**
Age	33.3 ± 12.1	29.0 ± 8.8	0.467
Educational duration	8.3 ± 0.9	8.6 ± 4.3	0.581
Marital status (single)	7 (63.6%)	5 (71.4%)	> 0.999
Working status (unemployed)	3 (27.3%)	2 (28.6%)	> 0.999

*$p < 0.05$

with intellectual disabilities, not only to sexual violence but also to pregnancies stemming from such abuse.

While various studies have addressed the rates of incestuous pregnancies or pregnancies resulting from sexual assaults in general [12, 33, 59], to the best of our knowledge, no study has directly compared the risk of pregnancy between incestuous and non-incestuous cases. In this study, which included reported cases of sexual violence, the observed frequency of pregnancy was found to be 14 times higher in incestuous cases compared to non-incestuous cases (11.3% vs. 0.8%, respectively). Similarly, a study involving 102 convicted sexual offenders reported that incest accounted for 17.5% of all incidents, with 6 out of 7 pregnancies resulting from incest. Although a direct comparison was not made in that study, simple calculations indicate that the likelihood of pregnancy was approximately 28 times higher in incestuous cases [51].

Several factors may contribute to the elevated risk of pregnancy in incest cases. First, the isolating nature of the home environment provides perpetrators with easy access to victims and facilitates secrecy [24, 37]. Studies have stated that intra-familial sexual abuse is often less visible and has fewer witnesses due to the private setting in which it occurs [36, 37]. As a result, incestuous abuse tends to be more prolonged, repetitive, and intrusive, thereby increasing the likelihood of pregnancy [31, 36]. Indeed, numerous studies have reported that the duration of abuse is significantly longer in incestuous cases [34, 36–39, 52]. Another critical factor is delayed disclosure, which may also result in prolonged and repetitive assaults. Various studies have demonstrated that intra-familial sexual abuse is associated with longer disclosure delays compared to extrafamilial abuse [31, 37, 47]. In the current study, the significantly longer duration and relatively higher number of sexual assaults in the IP group may explain the increased likelihood of pregnancy in incestuous cases.

The dynamics of delayed disclosure in incest cases are shaped by various factors related to the victim, perpetrator, family, and sociocultural context [25, 41]. One notable factor can be the perceived preservation of family unity or the so-called "happiness" of the family, which disclosure may threaten [41, 47]. Therefore, families may be reluctant to disclose when the offender is a family member [60]. In the research conducted by Gencer et al., all complaint withdrawals occurred exclusively within the

intrafamilial sexual abuse group [53]. Likewise, Fischer and McDonald reported significantly greater resistance to disclosure in intrafamilial cases compared to extrafamilial ones (10% and 3%, respectively) [36].

Findings from our study similarly suggest a reduced likelihood of disclosure by family members in incestuous cases. Notably, no case in the (IP) group was reported by a perpetrator's first- or second-degree relative, though this may be coincidental due to the limited sample size. In contrast, reports from teachers and healthcare providers were more frequent in the IP group, underscoring their vital role in identifying victims who may lack familial support [12].

This finding emphasizes the need for improved teacher training and establishing clear, supportive reporting mechanisms within schools to ensure timely and appropriate responses to suspicions of abuse. Teachers should also be equipped with resources that help them respond sensitively to disclosures, safeguarding the child while minimizing re-traumatization risk. Furthermore, a multidisciplinary approach involving school counselors, healthcare professionals, and child protection services is essential in supporting both victims and families following disclosure [61]. Ultimately, fostering an environment of safety, trust, and education is key not only to preventing abuse but also to facilitating recovery and healing for affected children.

Another factor that may contribute to delayed disclosure in incest cases is the perpetrator's exploitation of his position of authority to secure the victim's compliance and silence [41]. Children's vulnerability and dependency are generally key elements of this strategy. Depending on their age and cognitive development, victims may not recognize the abusive behavior as inappropriate or harmful, particularly when the perpetrator is a trusted family member [25, 41]. As a result, the abuse may begin at an early age and persist over an extended period. In line with this, the present study found that sexual assaults started significantly earlier in the IP group.

Additionally, a strong and statistically significant negative correlation was observed in the IP group between victims' duration of education and the gestational age at the time of pregnancy detection ($p = 0.009$, $r = -0.743$). No such correlation was found in the n-IP group. Although both findings may be coincidental due to the small sample size, similar associations have been reported in the literature. For instance, in their 20-year study involving 1,270 rape-related pregnancies, Toledo Blake et al. reported a link between educational level and earlier presentation for abortion services [62]. As with sexual assault disclosure, awareness appears to play a critical role in facilitating early intervention in sexual violence pregnancies. Such understanding is often shaped by factors including education level and age. It is important to reiterate that our limited sample size precluded drawing definitive conclusions on this correlation. Therefore, the observed association should be considered exploratory, primarily serving to generate hypotheses for future research on potential correlations between age, educational status, and the timing of gestational detection.

It is well established that the negative consequences of child sexual abuse are further exacerbated when accompanied by physical violence. The literature generally suggests that concurrent physical violence is more prevalent in extrafamilial sexual assaults, whereas psychological or emotional violence, such as threats and intimidation, is more common in intrafamilial incidents [36, 37, 43]. However, in our pregnancy sample, there were no histories or examination findings in both groups indicating concurrent acute physical violence. On the other hand, chronic exposure to physical violence was more common in the IP group. And remarkably, the perpetrators of physical violence were always first or second-degree relatives and, in almost all cases, the same individuals responsible for the sexual assault.

Earlier literature, consistent with our findings, has highlighted the significance of chronic physical abuse in incestuous sexual assaults. While McCormack et al. reported that serial rapists who are victims of incest in childhood were more likely to report parental physical abuse compared to non-incestuous ones [63], Estes and Tidwell emphasized that the mothers of incest victims were more frequently exposed to physical abuse within their families [64]. However, to the best of our knowledge, no recent studies have specifically evaluated chronic physical abuse in the context of incestuous versus non-incestuous sexual assaults. Further comprehensive research in this subject is needed to shed light on the dynamics distinguishing these two forms of sexual violence.

The kinship of perpetrators in incestuous assaults varies across countries and cultures; however, biological or stepfathers and brothers are generally the most common offenders [24, 33, 37, 48, 50, 51, 53, 59, 65, 66]. In the current study, the perpetrators in the IP group were predominantly fathers and brothers, whereas in the n-IP group, they were mainly neighbors and boyfriends. Notably, in all n-IP cases, the perpetrator was also known to the victim, and none of the assaults were isolated incidents.

In the study, the incestuous pregnancies were reported significantly later in towns and villages compared to cities ($p = 0.029$, 20.5 vs. 13.0 weeks, respectively). While not statistically significant due to the limited sample size, they also tended to be reported later than non-incestuous pregnancies within the same rural settings ($p = 0.165$, 20.5 vs. 11.5 weeks, respectively). These findings may lead to the speculation that in smaller settlements or close-knit communities, there may be a more prevalent

tendency to conceal pregnancies when they result from incest. This tendency may arise from a protective attitude toward the family member involved or from fear of the family's social stigmatization within the community [25, 29, 43, 60]. However, this speculation and interpretation warrant further investigation.

Both incestuous and non-incestuous sexual assaults may occur across all social strata. Nevertheless, many researchers from the same country have stated that they tend to be more common in crowded families with low income, low parental unity, and low educational levels [12, 33, 51, 59]. In the current study, both groups exhibited low levels of victim and parental education, low parental unity, and low income, with no significant differences between them. However, these factors were more pronounced in the IP group. Similarly, the number of children in the family exceeded the national and regional averages in both groups, but tended to be higher in the IP group.

Early detection is of paramount importance in pregnancies resulting from sexual violence, regardless of whether they are incestuous. However, incest-related pregnancies are generally detected at more advanced gestational ages [43, 62]. In our study, the average gestational age at detection was 15.3 weeks in both groups, which is significantly above the national legal abortion limit of 10 weeks. Nevertheless, national law permits abortion up to 20 weeks if the pregnancy results from a criminal act. Accordingly, abortion was performed in all but four cases that exceeded the 20-week threshold.

Limitations

This single-center study was conducted in Eskişehir, Türkiye, a city with a population of approximately 900,000. Sociocultural, religious, and economic factors, known to vary significantly between regions and countries, may influence the prevalence and characteristics of pregnancies resulting from incestuous and non-incestuous sexual violence. Therefore, the findings reflect the specific dynamics of a particular region and may not be generalizable to broader geographical or cultural contexts.

The most important limitation of the study was the small number of pregnancy cases resulting from sexual violence. Sexual violence pregnancies are highly sensitive issues and may be relatively rare events, making them particularly challenging to study. Despite being the sole center in Eskişehir responsible for forensic medical evaluations of reported sexual assaults, only 18 such pregnancies were documented over a decade. This limited sample size may have reduced the statistical power of some analyses.

Additionally, the retrospective design of the study restricted the assessment of long-term consequences, including obstetric complications, maternal mental health, or offspring outcomes, as continuous medical follow-up of the victims was not feasible. Furthermore, long-term follow-up could have provided valuable insights into the literature by examining the differences between pregnancies that ended in delivery and those that did not. This represents a significant limitation of the current study. Prospective, multicenter studies with larger sample sizes and structured follow-up are needed to address these gaps and provide a more comprehensive understanding of the short- and long-term consequences of pregnancies resulting from sexual violence, as well as the differences between incestuous and non-incestuous cases.

Another important limitation of this study is the potential selection and reporting bias. All cases were drawn from a single forensic center and included only those referred by judicial authorities, inherently excluding pregnancies resulting from sexual violence that were either not reported or not referred. Therefore, selection bias may lead to an underestimation of the true burden of sexual violence-related pregnancies. Reporting bias may also affect the findings: As the violence originates outside the family, non-incestuous cases may be more likely to be reported, whereas incestuous assaults may remain hidden unless pregnancy occurs. In addition, due to the high probability of underreporting in incest cases, especially when no pregnancy occurs, the 14-fold higher frequency observed in the incestuous cohort may overestimate the true magnitude of the difference. Future studies should consider these limitations and incorporate strategies to account for under-reporting and the differential visibility of incestuous versus non-incestuous cases.

Conclusions

This study highlights that incestuous sexual violence predominantly affects children and adolescents. It also underscores that adolescents and young adults with intellectual disabilities are at an elevated likelihood of pregnancy resulting from sexual violence, regardless of whether the abuse is incestuous. However, the incestuous pregnancy group demonstrated poorer prognostic factors for long-term outcomes, including earlier onset, longer duration, and greater exposure to chronic physical abuse. Within this context, in our study sample of reported sexual violence cases, a 14-fold higher frequency of pregnancy was observed in the incestuous cohort relative to the non-incestuous cohort. Furthermore, the findings suggest that families may be less inclined to report incestuous abuse and that there may be a more prevalent tendency in the study sample to conceal incestuous pregnancies in smaller settlements. We believe that the prolonged duration and higher frequency of abuse, combined with family-driven concealment and

delayed disclosure, contribute to the elevated pregnancy likelihood observed in incest cases.

Recommendations

Sexual violence has far-reaching public health consequences that extend beyond individual experiences to affect entire communities. It contributes to increased burdens on reproductive healthcare systems through unintended pregnancies, unsafe abortions, and complications during childbirth [67–69]. Survivors also experience elevated risks of mental health disorders, such as depression, anxiety, and post-traumatic stress, which in turn create long-term demands on healthcare and social services [68, 69]. The intergenerational effects, including disrupted family structures and impaired child development, further magnify the societal impact [67, 68]. These outcomes collectively underscore sexual violence as not only a medicolegal issue but also a major public health challenge, necessitating integrated prevention strategies, accessible healthcare, and sustained policy interventions.

The findings of this study emphasize challenges in the prevention, detection, and response systems surrounding sexual violence, particularly in cases involving incestuous abuse. The substantially higher likelihood of pregnancy, earlier onset and prolonged duration of abuse, and increased chronic exposure to physical violence associated with incestuous pregnancies underscore the urgent need for targeted social policy interventions and strengthened public health strategies [70]. These results point to a systemic failure, at least within the context of the study location, in protecting minors and individuals with intellectual disabilities from sexual exploitation within familial contexts.

To better protect these vulnerable groups, education policies must first prioritize the implementation of age- and developmentally appropriate sexual education curricula that address bodily autonomy, consent, and the possibility of intrafamilial abuse [71, 72]. This is especially crucial for youth with intellectual disabilities, who are often excluded from tailored education and prevention strategies [73].

Additionally, reporting policies should be reinforced with comprehensive training programs for teachers, school staff, and healthcare professionals, who are often the first to recognize and report abuse. As our findings suggest, their pivotal role in identifying incestuous abuse necessitates institutional support, legal clarity, and specialized psychological training to manage disclosures effectively and sensitively [74, 75]. Delays in pregnancy detection, often due to social concealment or lack of awareness, also call for improved coordination between forensic, medical, and social services [75]. Complementing these professional measures, public awareness campaigns should challenge the cultural stigma and silence surrounding incest, particularly in rural and under-resourced regions [76]. Together, these policy measures can help dismantle the barriers that keep incestuous sexual violence hidden, ensuring that the most vulnerable receive the protection and care they deserve.

The topic of abortion, particularly in the context of sexual violence, raises complex ethical, social, forensic, and religious debates. Accordingly, abortion regulations, including legal gestational limits, vary considerably across countries [77]. When establishing these legal limits, especially for pregnancies resulting from sexual violence, several factors should be considered, including the victim's age, mental and physical health, psychological well-being, the anticipated quality of life for the child to be born, and, most importantly, the victim's autonomous decision. Moreover, legal frameworks surrounding sexual violence and pregnancy should ensure that vulnerable populations, have timely access to reproductive healthcare, including abortion services, as well as comprehensive medical, psychosocial, and long-term support.

As a final point, the scope, definition, and legal framework of incest vary considerably across cultures and countries [29]. Some jurisdictions criminalize only certain forms of incest (e.g., parent–child but not cousin marriage), and penalties may range from fines to life imprisonment, or even the death penalty, depending on the country [78]. Turkish law does not categorically prohibit incest; however, it classifies incest as an aggravating factor in cases of sexual assault or abuse, whereby the penalty imposed on the perpetrator is subject to a statutory increase by half [45]. In this study, we defined as incestuous only those relationships legally recognized as aggravating circumstances under Turkish law. In conclusion, the lack of a universal definition and the influence of local norms mean that research findings, prevalence data, and legal or social policies are not readily generalizable across borders. Nevertheless, future research would benefit from adopting standardized definitions and cross-cultural frameworks to enable more accurate comparisons and evidence-based policy development. This, in turn, would further strengthen public health interventions against sexual violence.

Supplementary Information

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Supplementary Material 1. Total data of incestuous (IP) and non-incestuous (n-IP) pregnancy cases.

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Authors' contributions
All authors contributed to the study's conception and design. Material preparation and data collection were performed by [Ümit Şimşek], and the data was analyzed by [Alper Özkök]. The first draft of the manuscript was written by [Alper Özkök] and [Yasemin Taş Torun]. All authors commented on previous versions of the manuscript. All authors read and approved the final manuscript.

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Data availability
The analyzed data of the pregnancy cohort were shared as a supplementary table. In addition, the total data coded and recorded can be shared by the corresponding author upon reasonable request.

Declarations

Ethics approval and consent to participate
This retrospective study using anonymized patient data was conducted in line with the Declaration of Helsinki (1964) and its later amendments or comparable ethical standards. Informed consent was not required in accordance with Turkish national regulations and institutional policies, as no identifiable personal data were used. The study protocol was approved by the Non-Interventional Clinical Research Board of Eskişehir Osmangazi University. To ensure confidentiality, each case was assigned a numerical code, and the data were recorded in an SPSS file. All data were stored securely on the computer of the researcher who collected them, with no personal identifiers included at any stage.

Consent for publication
Not applicable.

Competing interests
The authors declare no competing interests.

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References

1. Hörnle T. The challenges of designing sexual assault law. Curr Leg Probl. 2024;77:49–80. https://doi.org/10.1093/CLP/CUAE002.
2. Rowland GE, Purcell JB, Lebois LAM, Kaufman ML, Harnett NG. Child sexual abuse versus adult sexual assault: A review of psychological and Neurobiological sequelae. Ment Heal Sci. 2024;2. https://doi.org/10.1002/MHS2.51.
3. Norman RE, Byambaa M, De R, Butchart A, Scott J, Vos T. The long-term health consequences of child physical abuse, emotional abuse, and neglect: a systematic review and meta-analysis. PLoS Med. 2012;9. https://doi.org/10.1371/JOURNAL.PMED.1001349.
4. Stoltenborgh M, van IJzendoorn MH, Euser EM, Bakermans-Kranenburg MJ. A global perspective on child sexual abuse: meta-analysis of prevalence around the world. Child Maltreat. 2011;16:79–101. https://doi.org/10.1177/1077559511403920.
5. Dworkin ER. Risk for mental disorders associated with sexual assault: A Meta-Analysis. Trauma Violence Abuse. 2020;21:1011–28. https://doi.org/10.1177/1524838018813198.
6. Spencer CN, Khalil M, Herbert M, Aravkin AY, Arrieta A, Baeza MJ, et al. Health effects associated with exposure to intimate partner violence against women and childhood sexual abuse: a burden of proof study. Nat Med. 2023;29:3243–58. https://doi.org/10.1038/S41591-023-02629-5.
7. Adams J, Mrug S, Knight DC. Characteristics of child physical and sexual abuse as predictors of psychopathology. Child Abuse Negl. 2018;86:167. https://doi.org/10.1016/J.CHIABU.2018.09.019.
8. Dworkin ER, Menon SV, Bystrynski J, Allen NE. Sexual assault victimization and psychopathology: A review and meta-analysis. Clin Psychol Rev. 2017;56:65. https://doi.org/10.1016/J.CPR.2017.06.002.
9. Violence against women. https://www.who.int/news-room/fact-sheets/detail/violence-against-women. Accessed 25 Sep 2025.
10. Gender Statistics. 2022. https://www.tuik.gov.tr/media/announcements/toplumsal_cinsiyet_istatistikleri.pdf. Accessed 25 Sep 2025.
11. Muratoglu G, Celikel A, Karbeyaz K. Evaluation of the incest cases in Hatay. Med Sci | Int Med J. 2018;7:257–9. https://doi.org/10.5455/MEDSCIENCE.2017.06.8736.
12. Gunduz T, Karbeyaz K, Ayranci U. Evaluation of the adjudicated incest cases in turkey: difficulties in notification of incestuous relationships. J Forensic Sci. 2011;56:438–43. https://doi.org/10.1111/J.1556-4029.2010.01662.X.
13. Erdoğan M, Aydın. İlinde 2018–2022 Yılları Arasında Çocuk İzlem Merkezine Başvuran cinsel istismar Olgularının adli Tıp Açısından Değerlendirilmesi: Bir retrospektif Tanımlayıcı Araştırma forensic evaluation of child sexual abuse cases applying to the child advocacy. 2024;29:214–21. https://doi.org/10.17986/blm.1707
14. Kırcı GS, Özer E, Birincioğlu İ, Aydoğdu Hİ, Askay M, İmamoğlu M. Evaluation of child sexual abuse cases. Bull Leg Med. 2021;26:78–84. https://doi.org/10.17986/blm.1367.
15. Demirci Ş, Doğan KH, Erkol Z, Deniz İ. Evaluation of child cases examined for sexual abuse in Konya. Türkiye Klin J Foren Med. 2008;5:43–9.
16. McNiss C, Kalarchian M, Laurent J. Factors associated with childhood sexual abuse and adolescent pregnancy. Child Abuse Negl. 2021;120. https://doi.org/10.1016/J.CHIABU.2021.105183.
17. Cunnington AJ. What's so bad about teenage pregnancy? J Fam Plan Reprod Heal Care. 2001;27:36–41. https://doi.org/10.1783/147118901101194877.
18. Leeners B, Richter-Appelt H, Imthurn B, Rath W. Influence of childhood sexual abuse on pregnancy, delivery, and the early postpartum period in adult women. J Psychosom Res. 2006;61:139–51. https://doi.org/10.1016/J.JPSYCHORES.2005.11.006.
19. Domhardt M, Münzer A, Fegert JM, Goldbeck L. Resilience in survivors of child sexual abuse: A systematic review of the literature. Trauma Violence Abus. 2015;16:476–93. https://doi.org/10.1177/1524838014557288/ASSET/IMAGES/LARGE/10.1177_1524838014557288-FIG1.JPEG.
20. Hailes HP, Yu R, Danese A, Fazel S. Long-term outcomes of childhood sexual abuse: an umbrella review. Lancet Psychiatry. 2019;6:830–9. https://doi.org/10.1016/S2215-0366(19)30286-X.
21. Scott J, Mullen C, Rouhani S, Kuwert P, Greiner A, Albutt K, et al. A qualitative analysis of psychosocial outcomes among women with sexual violence-related pregnancies in Eastern Democratic Republic of congo. Int J Ment Health Syst. 2017;11:1–10. https://doi.org/10.1186/S13033-017-0171-1/TABLES/1.
22. Hitzler M, Bach AM, Köhler-Dauner F, Gündel H, Kolassa IT. Long-Term consequences of childhood maltreatment among postpartum Women-Prevalence of psychosocial risk factors for child welfare: an independent replication study. Front Psychiatry. 2022;13:836077. https://doi.org/10.3389/FPSYT.2022.836077.
23. Noll JG, Trickett PK, Harris WW, Putnam FW. The cumulative burden borne by offspring whose mothers were sexually abused as children: descriptive results from a multigenerational study. J Interpers Violence. 2008;24:424. https://doi.org/10.1177/0886260508317194.
24. Seto MC, Babchishin KM, Pullman LE, McPhail IV. The puzzle of intrafamilial child sexual abuse: a meta-analysis comparing intrafamilial and extrafamilial offenders with child victims. Clin Psychol Rev. 2015;39:42–57. https://doi.org/10.1016/J.CPR.2015.04.001.
25. Tener D. The secret of intrafamilial child sexual abuse: who keeps it and how? J Child Sex Abus. 2018;27:1–21. https://doi.org/10.1080/10538712.2017.1390715.
26. Incest etymology.https://www.google.com/search?q=incest+etymology&sca_esv=26ff8a3d5dba2cb8&rlz=1C1FKPE_enTR1146TR1146&biw=1920&bih=919&sxsrf=AHTn8zoy6to5HEkMyk_943x49YaOFChraA%3A1744814672408&ei=UML_Z4XlGOqG7NYP4_Sa2AY&ved=0ahUKEwiFsP2V5dyMAx%20VqA9sEHWO6BmsQ4dUDCBA&uact=5&o. Accessed 16 Apr 2025.
27. Incest APA. Dictionary of Psychology. https://dictionary.apa.org/incest. Accessed 16 Apr 2025.

28. Incest O. Apr dictionary. https://web.archive.org/web/20130626012345/http://oxforddictionaries.com/us/definition/american_english/incest. Accessed 16 2025.
29. Eroglu İ, Yildiz A, Seviçin S. Incestuous childhood sexual abuse between siblings resulting in pregnancy without sexual intercourse. J Forensic Sci. 2022;67:1743–7. https://doi.org/10.1111/1556-4029.15023.
30. Sarles RM, Incest. Pediatr Rev. 1980;2:51–4. https://doi.org/10.1542/PIR.2-2-51.
31. Loinaz I, Bigas N, Sousa AM. Comparing intra and extra-familial child sexual abuse in a forensic context. Psicothema. 2019;31:271–6. https://doi.org/10.7334/PSICOTHEMA2018.351.
32. Paulo S, Panhoni VS, Cohen C, Gobbetti G, Drezett J. Intra and extrafamily sexual abuse violence against children and adolescents resulting in pregnancy attended at a health reference service,. 2019;33:1–8. https://doi.org/10.4322/hra.000319
33. Koçtürk N, Yüksel F. Characteristics of victims and perpetrators of intrafamilial sexual abuse. Child Abuse Negl. 2019;96. https://doi.org/10.1016/J.CHIABU.2019.104122.
34. Unlu G, Cakaloz B. Effects of perpetrator identity on suicidality and nonsuicidal self-injury in sexually victimized female adolescents. Neuropsychiatr Dis Treat. 2016;12:1489–97. https://doi.org/10.2147/NDT.S109768.
35. Ventus D, Antfolk J, Salo B. The associations between abuse characteristics in child sexual abuse: a meta-analysis. J Sex Aggress. 2017;23:167–80. https://doi.org/10.1080/13552600.2017.1318963.
36. Fischer DG, McDonald WL. Characteristics of intrafamilial and extrafamilial child sexual abuse. Child Abuse Negl. 1998;22:915–29. https://doi.org/10.1016/S0145-2134(98)00063-5.
37. Magalhães T, Taveira F, Jardim P, Santos L, Matos E, Santos A. Sexual abuse of children. A comparative study of intra and extra-familial cases. J Forensic Leg Med. 2009;16:455–9. https://doi.org/10.1016/J.JFLM.2009.05.007.
38. Erickson WD, Walbek NH, Seely RK. Behavior patterns of child molesters. Arch Sex Behav. 1988;17:77–86. https://doi.org/10.1007/BF01542053.
39. Mian M, Wehrspann W, Klajner-Diamond H, Lebaron D, Winder C. Review of 125 children 6 years of age and under who were sexually abused. Child Abus Negl. 1986;10:223–9. https://doi.org/10.1016/0145-2134(86)90083-9.
40. Trickett PK, Noll JG, Putnam FW. The impact of sexual abuse on female development: lessons from a multigenerational, longitudinal research study. Dev Psychopathol. 2011;23:453. https://doi.org/10.1017/S0954579411000174.
41. Paine ML, Hansen DJ. Factors influencing children to self-disclose sexual abuse. Clin Psychol Rev. 2002;22:271–95. https://doi.org/10.1016/S0272-7358(01)00091-5.
42. Snyder HN. Sexual assault of young children as reported to law enforcement: Victim, incident, and offender characteristics. 2000.
43. Bessa MMM, Drezett J, Adami F, de Araújo SDT, Bezerra IMP, de Abreu LC. Characterization of adolescent pregnancy and legal abortion in situations involving incest or sexual violence by an unknown aggressor. Med (Kaunas). 2019;55. https://doi.org/10.3390/MEDICINA55080474.
44. Farahi N, McEachern M. Sexual assault of women. Am Fam Physician. 2021;103:168–76.
45. Penal Code of Turkey. Article 102 (3)-c and 103 (3)-c. https://www.venice.coe.int/webforms/documents/default.aspx?pdffile=CDL-REF(2016)011-e. Accessed 16 Apr 2025.
46. Finkelhor D. The international epidemiology of child sexual abuse. Child Abuse Negl. 1994;18:409–17. https://doi.org/10.1016/0145-2134(94)90026-4.
47. Rakovec-Felser Z, Vidovic L. Maternal perceptions of and responses to child sexual abuse. Slov J Public Heal. 2016;55:124. https://doi.org/10.1515/SJPH-2016-0017.
48. Csorba R, Lampé L, Borsos A, Balla L, Póka R, Oláh É. Female child sexual abuse within the family in a Hungarian County. Gynecol Obstet Invest. 2006;61:188–93. https://doi.org/10.1159/000091274.
49. Yüce M, Karabekıroğlu K, Yildirim Z, Şahın S, Sapmaz D, Babadağı Z, et al. The psychiatric consequences of child and adolescent sexual abuse. Nöro Psikiyatr Arşivi. 2015;52:393. https://doi.org/10.5152/NPA.2015.7472.
50. Bağ Ö, Alşen S. The evaluation of child sexual abuse in a child advocacy center: one year experience of a center. Anatol J Psychiatry. 2017;18:62–8. https://doi.org/10.5455/APD.214951.
51. Gölge Z, Yavuz M, Yüksel Ş. Cinsel saldırgan profili. Adli Tıp Derg. 2006;20:1–17.
52. Zambon M, Jacintho A, Medeiros M, Guglielminetti R, Marmo D. Domestic violence against children and adolescents: a challenge. Rev Assoc Med Bras. 2012;58:465–71.
53. Gencer Ö, Özbek A, Özyurt G, Kavurma C. Çocuk ve ergenlerde aile dışı ve aile içi cinsel istismar olgularının karşılaştırılması. Anadolu Psikiyatr Derg. 2016;17:56–64. https://doi.org/10.5455/APD.1419190512.
54. Essabar L, Khalqallah A, Dakhama BSB. Child sexual abuse: report of 311 cases with review of literature. Pan Afr Med J. 2015;20. https://doi.org/10.11604/PAMJ.2015.20.47.4569.
55. Stroebel SS, O'Keefe SL, Beard KW, Kuo SY, Swindell SVS, Kommor MJ. Father–daughter incest: data from an anonymous computerized survey. J Child Sex Abus. 2012;21:176–99. https://doi.org/10.1080/10538712.2012.654007.
56. Girardin B, Faugno D, Howitt J. Adult sexual assault: practical managment. In: Payne J, Busutil A, Smock A, editors. Forensic medicine clinical and pathological aspects. San Francisco, London: GMM Publishing; 2003. pp. 409–51.
57. Russell DEH. The incidence and prevalence of intrafamilial and extrafamilial sexual abuse of female children. Child Abuse Negl. 1983;7:133–46. https://doi.org/10.1016/0145-2134(83)90065-0.
58. Middleton W. Parent-child incest that extends into adulthood: A survey of international press reports, 2007–2011. J Trauma Dissociation. 2013;14:184–97. https://doi.org/10.1080/15299732.2013.724341.
59. Yildirim A, Ozer E, Bozkurt H, Ozsoy S, Enginyurt O, Evcuman D, et al. Evaluation of social and demographic characteristics of incest cases in a university hospital in Turkey. Med Sci Monit. 2014;20:693–7. https://doi.org/10.12659/MSM.890361.
60. Veggi S, Zara G. Til prison do Us Part!' Uncovering women's reactions to child sexual abuse perpetrated by their partners. J Forensic Psychol Res Pract. 2024;24:733–51. https://doi.org/10.1080/24732850.2023.2249454.
61. Walsh K, Eggins E, Hine L, Mathews B, Kenny MC, Howard S, et al. Child protection training for professionals to improve reporting of child abuse and neglect. Cochrane Database Syst Rev. 2022;7. https://doi.org/10.1002/14651858.CD011775.PUB2.
62. De Toledo Blake M, Drezett J, Machi GS, Pereira VX, Raimundo RD, Oliveira FR, et al. Factors associated with the delay in seeking legal abortion for pregnancy resulting from rape. Int Arch Med. 2015;8. https://doi.org/10.3823/1628.
63. McCormack A, Rokous FE, Hazelwood RR, Burgess AW. An exploration of incest in the childhood development of serial rapists. J Fam Violence. 1992;7:219–28. https://doi.org/10.1007/BF00979029/METRICS.
64. Estes LS, Tidwell R. Sexually abused children's behaviours: impact of gender and mother's experience of intra- and extra-familial sexual abuse. Fam Pract. 2002;19:36–44. https://doi.org/10.1093/FAMPRA/19.1.36.
65. Seto MC, Lalumière ML, Kuban M. The sexual preferences of incest offenders. J Abnorm Psychol. 1999;108:267–72. https://doi.org/10.1037/0021-843X.108.2.267.
66. Pierce RL, Pierce LH. Analysis of sexual abuse hotline reports. Child Abuse Negl. 1985;9:37–45. https://doi.org/10.1016/0145-2134(85)90090-0.
67. Jina R, Thomas LS. Health consequences of sexual violence against women. Best Pract Res Clin Obstet Gynaecol. 2013;27:15–26. https://doi.org/10.1016/j.bpobgyn.2012.08.012.
68. Letourneau EJ, Brown DS, Fang X, Hassan A, Mercy JA. The economic burden of child sexual abuse in the united States. Child Abus Negl. 2018;79:413–22. https://doi.org/10.1016/j.chiabu.2018.02.020.
69. Peterson C, Kearns MC, McIntosh WLKW, Estefan LF, Nicolaidis C, McCollister KE, et al. Lifetime economic burden of intimate partner violence among U.S. Adults. Am J Prev Med. 2018;55:433–44. https://doi.org/10.1016/j.amepre.2018.04.049.
70. Lerios H, World. J Hum Dyn Soc Relations. 2025;4:30–42. https://doi.org/10.62718/VMCA.SSL-WJHDSR.4.1.SC-1224-041.
71. Lehtonen J, Puutio E, Pihkala S, Huuki T. Navigating with pre-teenage children for sexuality education. Sex Educ. 2024;24:602–16. https://doi.org/10.1080/14681811.2023.2237428.
72. Breuner CC, Mattson G. Sexuality education for children and adolescents. Pediatrics. 2016;138. https://doi.org/10.1542/PEDS.2016-1348.
73. McDaniels B, Fleming A. Sexuality education and intellectual disability: time to address the challenge. Sex Disabil. 2016;34:215–25. https://doi.org/10.1007/S11195-016-9427-Y/METRICS.
74. RS R. Incest: the school's role. J Sch Health. 1982;52:365–70. https://doi.org/10.1111/J.1746-1561.1982.TB07136.X.
75. Nabihah N, Mannan A, Saadah N, Aun M, Fauziah I. Knowledge of social work students on incest. Int J Acad Res Progress Educ Dev. 2021;10. https://doi.org/10.6007/IJARPED/v10-i1/9683.
76. Newman EF, Efthymiadou E, Quayle E, Squire T, Denis D, Wortley R, et al. The impact of a public health campaign to deter viewing of child sexual abuse images online: A case study of the UK stop it Now! campaign. Sex Abus. 2024;36:635–61. https://doi.org/10.1177/10790632231205784.

77. World Health Organization (WHO). The Global Abortion Policies Database. Sexual and Reproductive Health and Rights (SRHR). https://abortion-policies.srhr.org/. Accessed 9 Apr 2024.
78. Hijriani H, Ramadani R. From criminal law to customary law: incest as a sexual crime. Yuridika. 2022;37:399–414. https://doi.org/10.20473/YDK.V37I2.32830.

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