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Child sexual abuse based on the crosswise model: a cross-sectional study on 18–24-year-old Iranian students

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A – Study Design, **B** – Data Collection, **C** – Statistical Analysis, **D** – Data Interpretation, **E** – Manuscript Preparation, **F** – Literature Search, **G** – Funds Collection

Summary **Background.** Child sexual abuse refers to the compulsory sexual stimulation of a child or adolescent by an adult or older adolescent and includes a wide range of behavior, such as exhibitionism, fondling, sexual intercourse and using children for pornography.
Objectives. The present study used the crosswise model to investigate childhood sexual abuse among Iranian university students.
Material and methods. This cross-sectional study used a multi-stage method to examine 1,500 subjects in the universities of Shahroud, Iran. The questionnaire consisted of a pair of questions evaluating sexual abuse based on the crosswise approach, one sensitive and the other non-sensitive. To ensure the confidentiality of information, the questionnaire was distributed anonymously among the 1,500 students of 6 universities, and the students' field of study was not mentioned. The collected data was analyzed with descriptive tests (mean and percent) and inferential tests, (independent *t*-test, chi-squared and crosswise) using SPSS 18 and STATA software.
Results. A total of 11% of the girls and 27% of the boys were found to have suffered a form of sexual abuse.
Conclusions. The results indicate a high prevalence of sexual abuse among Iranian children. Evaluating sexual abuse helps health policymakers to focus on parent training through health programs and educational programs in schools.
Key words: child abuse, students, cross-sectional studies.

Background

Nowadays, the problem of violence against children is one of the top priorities for managers and health planners in many parts of the world, especially in developing countries. Violence against children is a serious problem for families, with short-term and long-term consequences for the victim. Besides imposing high costs on the families, this issue can result in costs for the healthcare, medical and judicial systems of countries. Violence can damage a child's emotional and physical development and can predispose him/her to risky behavior [1–3].

Child sexual abuse (CSA) refers to the compulsory sexual stimulation of a child or adolescent by an adult or older adolescent who is in a relationship of authority and trust. There is a wide range of behavior, such as unwanted sexual contact (e.g., kissing or fondling), sexual intercourse and unwanted, non-contact sexual experiences (e.g., using children for pornography) [4]. Numerous studies have been conducted on physical and psychological abuse in Iran and other countries, but there are no accurate statistics about sexual abuse in children and adolescents, owing to the sensitivity of the subject [2–6]. The effects of child sexual abuse include physical consequences such as growth disorders [7] and psychological disorders such as depression and anxiety [8]. Furthermore, risky behaviors such as suicide and risky sexual behaviors are more common in children subjected to sexual abuse than normal subjects. Investigating child sexual abuse is crucial in communities owing to its anomalous physical and mental effects in children and adolescents [9, 10]. Different estimates have been reported for the incidence of sexual abuse in different countries: 9–18% in Turkey [1, 4], 26.6% of girls and 5% of boys in the US [10] and 7–30% of girls and 3–13% of boys in the UK, for instance [11].

The effects of child sexual abuse include physical consequences, such as growth disorders [12] or sexually transmitted infections, and psychological disorders like depression, poor self-esteem, problems at school, eating disorders and anxiety [13––15]. Furthermore, risky behavior, such as suicide and risky sexual behaviors are more common in children who have been subjected to sexual abuse than in other children [16, 17]. In adulthood, mental illnesses like depression, posttraumatic stress disorder (PTSD), and substance abuse are examples of other health problems caused by violence against children. Sexual violence occurs in all age groups, social classes and economic classes in almost all countries, with differences in geographic area [18–20]. Also, sexually abused children tend to have fewer close friends in adolescence, more conflict with their parents and more sexual partners, as well as exhibiting more risky sexual behavior [15].

A variety of risk factors for CSA have been reported, including parents with mental illness, alcohol or drug dependency and alcohol consumption, development of mental disorders, single-parent homes, harsh punishment, poor family and parent–child relationships and unwanted pregnancy from the [6, 9]. There are many obstacles which deter children from reporting violence, including familial reasons: families with strict gender roles, patriarchal attitudes, a power imbalance in the family, a chaotic family structure, inefficient relationships with the family and social isolation. Environmental factors such as a lack of intervention from the school in order to create a supportive environment for the child and the child being stigmatized by a negative response from the community after revealing violence are among the other reasons for the child not to expose the violence. Because of these obstacles, precise statistics of violence in a given country are impossible to gather, so using ap-

propriate statistical methods that can overcome these barriers seems essential [20, 21]. Almost sensitive issues have evaluated the prevalence of sexual abuse using direct questions. When encountering sensitive questions, people may avoid giving an honest answer out of fear, mistrust or guilt. Consequently, the reliability of any findings is compromised due to regular deviation from the actual state [22]. It seems that indirect estimation methods are more suitable for investigating many sensitive issues such as sexual behavior [23] and addiction [24, 25]. Among indirect methods, the crosswise model is very simple to use and it allows the information it provides to be confidential. Given the sensitivity of sexual abuse in the eyes of the public, the present study was conducted to estimate the prevalence of CSA in Iranian university students using the crosswise model.

Objectives

The present study uses the crosswise model to investigate childhood sexual abuse in Iranian university students.

Material and methods

Study design

This was a cross-sectional study conducted from November 2012 to February 2013.

Participants

A total of 1,500 students who were between 18 and 24 years old were selected from 6 universities in Shahroud, Iran.

Sampling method

A multistage method was used for the sampling method. Every university was considered a separate category and every classroom was considered a cluster. The number of clusters which were entered into the sampling was proportionate to the number of students in the university, which ranged between 400 and 9,000. Random sampling was used to select the candidates from a list of classrooms which was prepared by the education offices of the universities.

Method

After making the necessary arrangements with the teachers, the researcher was introduced to the students. They received a brief explanation of the necessity for and objectives of the study and were asked to participate in the study voluntarily. The questionnaires were completed by the participants in the last 15 minutes of classroom sessions. The questionnaire items were associated with demographic and socioeconomic information (father's level of education, mother's level of education, father's employment status, mother's employment status, birth order and place of residence) and the crosswise model questions.

Table 1. The crosswise model questions

Paired questions	Answers
"Please recall the number of your most commonly used bank card. Is the last digit 5, 6 or 7?"	A – if the answer to both the sensitive and the non-sensitive questions is either "yes" or "no"
"Did you experience sexual abuse in your childhood, including body massage, indecent exposure and/or sexual intercourse?"	B – if the answer is "yes" to one question and "no" to the other one

In the crosswise method, respondents are given a pair of independent questions, including a sensitive question and a non-sensitive one, which should be answered with "A" or "B". The prevalence of the non-sensitive item (the last digit of a bank card being 5, 6 or 7) was found to be 24% in the population [23]. The other question of the pair – the sensitive one – was "Did you experience sexual abuse in your childhood, including body massage, indecent exposure and/or sexual intercourse?" The respondents were asked to select "A" if their answer to both questions was either "yes" or "no"; otherwise, if the answer was "yes" to one of the questions and "no" to the other, they should select option "B" (Table 1).

The estimated prevalence of sexual abuse is obtained by equation (1):

$$(1) \quad \lambda = p\pi + (1 - p)(1 - \pi),$$

where:
λ = the proportion of respondents who choose A,
π = the proportion of respondents who were sexually abused,
p = the probability of a positive response to the non-sensitive item ($p = 0.24$).

An orthogonal estimate is obtained through Equation (2):

$$(2) \quad \pi = \frac{\lambda + P - 1}{2P - 1}.$$

The variance of π is calculated with Equation (3). It should be noted that the second part of the equation is due to the insensitive item.

$$(3) \quad Var(\pi) = \left[\frac{\pi(1 - \pi)}{n}\right] + \left[\frac{p(1 - p)}{n(2p - 1)^2}\right].$$

The subjects completed the questionnaires within about 15 minutes. The data was analyzed with descriptive tests (mean and percent) and inferential tests, (independent t-test, chi-squared and crosswise) using SPSS 18 and STATA software.

Ethical consideration

This study was carried out by Shahroud University of Medical Sciences under the ethics code 890/08.

Results

All participants answered the crosswise model questions from the questionnaire, but only 1,480 of the 1,500 subjects completed the demographic and socioeconomic items. In terms of age, 885 (60.5%) were 18–20 years old and 578 (39.5%) were 21–24 years old; 535 subjects (36.8%) were male and 919 (63.2%) were female; 170 (11.6%) had recently gotten married and 1,292 (88.4%) were single. Other findings are presented in Table 2.

Table 2. Frequency of sexual abuse in students by their parental socio-economic and demographic characteristics

Variable		n	%
Father's level of education	illiterate	64	(4.3)
	barely literate	285	(19.4)
	junior high school	269	(18.3)
	some high school	448	(30.4)
	high school diploma	160	(10.9)
	university degree	246	(16.7)
	no response	5	–

Mother's level of education	illiterate	72	(4.9)
	barely literate	392	(26.7)
	junior high school	277	(18.9)
	some high school	485	(33.0)
	high school diploma	109	(7.4)
	university degree	133	(9.1)
	no response	12	–
Father's employment status	unemployed	95	(6.6)
	employed	1,343	(93.4)
	no response	42	–
Mother's employment status	housewife	1,223	(83.0)
	employed	250	(17.0)
	no response	7	–
Birth order	first-born	477	(32.4)
	middle-born	476	(32.4)
	last-born	517	(35.2)
	no response	10	–
Place of residence	village	1,300	(91.5)
	town	120	(8.5)
	no response	60	–
Sexual abuse	girls	11 95% CI (3,19)	Per/100
	boys	27 95% CI (16,38)	Per/100

Discussion

The findings which were calculated by the formulas presented in the Material and Method section suggest that 11% of the girls and 27% of the boys might have experienced some form of sexual abuse in their childhood. Statistics from other countries have shown that the prevalence rate of sexual violence is 34.4% in Africa, 37.8% in Australia, 32.2% in Costa Rica, 31% in Tanzania, 30.7% in Israel, 28.1% in Sweden, 25.3% in the US and 24.2% in Switzerland [26]. Sexual abuse behaviors are often incompletely reported [27]; nevertheless, the crosswise model used in the present study enabled the researcher to statistically and indirectly determine the prevalence of sexual abuse behaviors in the population [24]. A study which was conducted in Turkey found that 14.4% of the subjects had suffered incest or sexual abuse by a first-degree relative during their childhood or adolescence [27]. A study entitled "The National Survey of Children's Exposure to Violence" in the United States reported that 14.3% of girls and 6% of boys aged 14–17 years had stated that they were sexually abused once in their childhood. Moreover, rape by a known adult was reported among 4.3% of the girls and 1.1% of the boys. A study showed that sexual abuse in India was reported by 4–41% of girls and by 10–55% of boys [28]. This suggests that in India, as in Iran, sexual abuse is higher among males. This may be because boys are more likely to be outdoors among youth groups than young girls are, so they are more exposed to harassment. In a study on 1,299 children in Poland, there were 58 cases (4.46%) of violence. Broken down by age, 13 were aged 0–10 years while the remaining 45 were 11–18 years old; 40 of them were girls and 18 were boys. Parents were the most prevalent source of violence and strangers were the least prevalent. In the study, 3.45% of the children had been sexually abused.

Training the students, establishing state-run awareness campaigns to educate children about environments likely to give rise to violence and using non-governmental organizations (NGOs) – such as religious organizations and self-organized groups – are among the ones that can be cited [8]. A study in Kenya demonstrated that empowerment programs, such as creating a supportive space for children to share stories of violence and empowering victims of violence to look for places to care for and support them, can reduce the incidence of violence against girls from 17.9 to 11.1%. These programs act as training sessions through roleplay, free discussions and verbal technical exercises. Increasing adolescent self-efficiency and awareness of the barriers to disclosure of violence, improving communication skills and increasing the use of supportive services were among the items in the program [29].

The crosswise model which was used in the present study failed to identify the perpetrators of the sexual abuse which had occurred; this is considered to be a study limitation. A cohort study which was conducted in the US found that 26.6% and 5.1% of 17-year-old female and male adolescents, 11.2% and 1.9% of female and male 16-year-olds and 16.8% and 4.3% of female and male 15-year-olds, respectively, had suffered from sexual abuse. These findings suggest that 17-year-old females had suffered from sexual abuse twice as often as their 16-year-old peers [30]. The crosswise model failed to segregate the subjects in terms of age when the sexual abuse occurred, which was another limitation of the crosswise method. Various complications of physically, psychologically and sexually abusive behaviors – such as posttraumatic stress [1, 10] – have been well-addressed in the literature. Likewise, the role of sexual abuse in the development of mental problems and further victimization in adulthood has been investigated [28, 31]. Childhood abuse was investigated by Felitti et al. as one of the leading causes of death in adults. They found that exposure to sexual abuse during childhood – compared to not experiencing it – increases the prevalence of sexually transmitted diseases by two to four times, increases body mass index by 1.4–1.6 times and increases the prevalence of mental disorders such as depression by 4 to 12 times [32].

Choosing university students for subjects is considered another limitation of this study. It is recommended to conduct a study on youth in the general public. Also, the researcher recommends investigating the same kinds of sexual abuse which were studied in other Iranian studies.

Conclusions

This study revealed that the prevalence of sexual abuse is high during childhood in Iran, and that boys are at twice the risk as girls. Investigating sexual abuse in society helps health policymakers to focus parents' attention more on sex education and training in health programs. It is recommended to develop educational programs and campaigns for kindergarten teachers and school teachers to train them in identifying the factors which suggest vulnerability. CSA is also alarming for families in order to focus on teaching safety to children and to prepare them with preventative situations. Furthermore, counseling services should be developed and given to families to provide support to those who care for the child.

References

1. Kalmakis KA, Chandler GE. Health consequences of adverse childhood experiences: a systematic review. *J Am Acad Nurse Pract* 2015; 27(8): 457–465.
2. Tucker MC, Rodriguez CM. Family dysfunction and social isolation as moderators between stress and child physical abuse risk. *J Fam Violence* 2014; 29(2): 175–186.
3. Karakurt G, Silver KE. Therapy for childhood sexual abuse survivors using attachment and family systems theory orientations. *Am J Fam Ther* 2014; 42(1): 79–91.
4. Murat Y, Karabekİroglu K, Yildirim Z, et al. The psychiatric consequences of child and adolescent sexual abuse. *Nöro Psikiyatri Arşivi* 2015; 52(4): 393, doi: 310.5152/npa.2015.7472.
5. Mahram M, Hosseinkhani Z, Nedjat S, et al. Epidemiologic evaluation of child abuse and neglect in school-aged children of qazvin province, Iran. *Iran J Pediatr* 2013; 23(2): 159–164.
6. Stephenson R, Sheikhattari P, Assasi N, et al. Child maltreatment among school children in the Kurdistan Province, Iran. *Child Abuse Negl* 2006; 30(3): 231–245.
7. Finkelhor D, Shattuck A, Turner HA, et al. The lifetime prevalence of child sexual abuse and sexual assault assessed in late adolescence. *J Adolesc Health* 2014; 55(3): 329–333, doi: 310.1016/j.jadohealth.2013.1012.1026.
8. Bażydło M, Giezek M, Zabielska P, et al. The phenomenon of domestic violence against children in north-western Poland. *Fam Med Prim Care Rev* 2018; 20(2): 106–111.
9. Hillis S, Mercy J, Amobi A, et al. Global prevalence of past-year violence against children: a systematic review and minimum estimates. *Pediatrics* 2016; 137(3): e20154079.
10. Chouliara Z, Karatzias T, Scott-Brien G, et al. Talking therapy services for adult survivors of childhood sexual abuse (CSA) in Scotland: perspectives of service users and professionals. *J Child Sex Abus* 2011; 20(2): 128–156.
11. Irish L, Kobayashi I, Delahanty DL. Long-term physical health consequences of childhood sexual abuse: a meta-analytic review. *J Pediatr Psychol* 2009; 35(5): 450–461, doi: 410.1093/jpepsy/jsp1118.
12. Pirdehghan A, Vakili M, Rajabzadeh Y, et al. Child abuse and mental disorders in Iranian adolescents. *Iran J Pediatr* 2016; 26(2): e3839, doi: 3810.5812/ijp.3839.
13. Chen Y-l, Liu X, Huang Y, et al. Association between child abuse and health risk behaviors among Chinese college students. *Journal of Child and Family Studies* 2017; 26(5): 1380–1387.
14. Lalor K. Child sexual abuse in sub-Saharan Africa: a literature review. *Child Abuse Negl* 2004; 28(4): 439–460.
15. Girardet RG, Lahoti S, Howard LA, et al. Epidemiology of sexually transmitted infections in suspected child victims of sexual assault. *Pediatrics* 2009; 124(1): 79–86.
16. Vakilian K, Mousavi SA, Keramat A. Estimation of sexual behavior in the 18-to-24-years-old Iranian youth based on a crosswise model study. *BMC Res Notes* 2014; 7(1): 28, doi: 10.1186/1756-0500-1187-1128.
17. Walsh K, Latzman NE, Latzman RD. Pathway from child sexual and physical abuse to risky sex among emerging adults: the role of trauma-related intrusions and alcohol problems. *J Adolesc Health* 2014; 54(4): 442–448.
18. Romero-Martínez A, Figueiredo B, Moya-Albiol L. Childhood history of abuse and child abuse potential: the role of parent's gender and timing of childhood abuse. *Child Abuse Negl* 2014 38(3): 510–516.
19. Choudhry V, Dayal R, Pillai D, et al. Child sexual abuse in India: a systematic review. *PLoS ONE* 2018; 13(10): e0205086.
20. Brown J, Cohen P, Johnson JG, et al. A longitudinal analysis of risk factors for child maltreatment: findings of a 17-year prospective study of officially recorded and self-reported child abuse and neglect. *Child Abuse Negl* 1998; 22(11): 1065–1078.
21. Alaggia R, Collin-Vézina D, Lateef R. Facilitators and barriers to child sexual abuse (CSA) disclosures: a research update (2000–2016). *Trauma Violence Abuse* 2019; 20(2): 260–283.
22. Vakilian K, Mousavi SA, Keramat A, et al. Knowledge, attitude, self-efficacy and estimation of frequency of condom use among Iranian students based on a crosswise model. *Int J Adolesc Med Health* 2016; 30(1), doi: 10.1515/ijamh-2016-0010.
23. Shamsipour M, Yunesian M, Fotouhi A, et al. Estimating the prevalence of illicit drug use among students using the crosswise model. *Subst Use Misuse* 2014; 49(10): 1303–1310, doi: 1310.3109/10826084.10822014.10897730.
24. Priebe G, Svedin CG. Child sexual abuse is largely hidden from the adult society: an epidemiological study of adolescents' disclosures. *Child Abuse Negl* 2008; 32(12): 1095–1108, doi: 1010.1016/j.chiabu.2008.1004.1001.
25. Vakilian K, Keramat A, Mousavi SA, et al. Experience assessment of tobacco smoking, alcohol drinking, and substance use among Shahroud University students by crosswise model estimation–the alarm to families. *Open Public Health J* 2019; 12(1), doi: 10.2174/1874944501912010033.
26. Singh MM, Parsekar SS, Nair SN. An epidemiological overview of child sexual abuse. *J Family Med Prim Care* 2014; 3(4): 430–435.
27. Bilginer Ç, Hesapçıoğlu ST, Kandil S. Sexual abuse in childhood: a multi-dimentional look from the view point of victims and perpetrators. *Düşünen Adam: Journal of Psychiatry and Neurological Sciences* 2013; 26: 55–64.
28. Finkelhor D, Turner HA, Shattuck A, et al. Prevalence of childhood exposure to violence, crime, and abuse: results from the national survey of children's exposure to violence. *JAMA Pediatr* 2015; 169(8): 746–754.
29. Sarnquist C, Omondi B, Sinclair J, et al. Rape prevention through empowerment of adolescent girls. *Pediatrics* 2014; 133(5): e1226––e1232.
30. Meyerson LA, Long PJ, Miranda Jr R, et al. The influence of childhood sexual abuse, physical abuse, family environment, and gender on the psychological adjustment of adolescents. *Child Abuse Negl* 2002; 26(4): 387–405, doi: 310.1016/S0145-2134(1002)00315-00310.
31. Carey PD, Walker JL, Rossouw W, et al. Risk indicators and psychopathology in traumatised children and adolescents with a history of sexual abuse. *Eur Child Adolesc Psychiatry* 2008; 17(2): 93–98.
32. Felitti VJ, Anda RF, Nordenberg D, et al. Relationship of childhood abuse and household dysfunction to many of the leading causes of death in adults: the Adverse Childhood Experiences (ACE) Study. *Am J Prev Med* 1998; 14(4): 245–258.

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