

Assessment of cyber abuse in sexually abused children and adolescents

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ABSTRACT

Objectives: Child sexual abuse is associated with adverse outcomes, including increased vulnerability, that may explain the risk of revictimization via cyber media and cyber abuse may be a risk factor for sexual abuse. The aims of the study were to explore cyber abuse prevalence in sexual abuse cases, the direct and indirect links between child sexual abuse and cyber abuse and to study the differences in internet use between children and adolescents who were sexually abused and the control group.

Methods: We assessed 75 children and adolescents aged 7-18 who had experienced sexual abuse and were referred to us between 01.01.2014-01.01.2015. Additionally, 45 typical developing subjects who did not have any abuse history were recruited from pediatrics clinic of or hospital as the control group. We used our semi-structured questionnaire to assess cyber abuse.

Results: The rates of internet use were high in the control group (97.8%) compared to those of sexually abused teens (82.7%). However, the rates of cyber abuse were similar between the groups. The most used web site/application was different between the groups. Facebook was the most used web site/application in the sexually abused group (69.4%). This ratio was only 20.5% in the control group.

Conclusions: We assessed cyber abuse in a population exposed to sexual abuse. As several authors have previously emphasized, the implementation of preventative steps is essential. There is a great need to develop and evaluate interventions with those children and young people, particularly in sexually abused children and adolescents who are thought to be more vulnerable to cyber abuse.

Keywords: child, abuse, sexual, cyber

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Computer and internet use has become a necessary requirement in our daily lives with introduction of the new technologies. Facilitating communication and research was the original aim of the Internet [1]. Besides adults, child and adolescents are increasingly using texting and online social networking sites to connect with other children and adolescents, with 63%

reporting exchanging text messages daily, 29% reporting daily communication through social networking sites and 95% of youth ages 12-17 are online [2]. However, the dramatic increase in the use of internet in the recent years has led to abusive behaviors between peers or cyberbullying in children and adolescents [3, 4].



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Cyber abuse is a broad term that includes online abusive behaviors including online bullying, stalking, sexual solicitation, and problematic exposure to pornography. Cyber abuse occurs perniciously via web-based and other forms of modern technology such as phone messages. Cyberbullying includes the use of e-mail, cell phones, and internet sites to threaten, harass, embarrass, exclude, or damage reputations and friendships [3, 5, 6]. Cyberstalking as an extension of physical stalking, involves use of the Internet to target victims and ranges from continuous unwanted contact to threats of violence and can escalate into attempts to control an individual's behavior [7]. Sexual solicitation involves requests to engage in sexual activities/talk or to provide personal sexual information, where the requests are uninvited and/or constitute an illegal relationship. Pornography can be identified as the production and circulation of sexual content through technology such as the Internet and cell phones. Problematic exposure to pornography includes either exposure to pictures of people who are naked or having sex, without having expected or looked for the pictures [8], or compulsively seeking pornography [9].

The term of child sexual abuse is defined as 'the use of a child or adolescent who has not yet completed sexual development by threatening or deceiving, using force to meet sexual desires and needs by an adult [10]. In a recent meta-analysis study, it was reported that the incidence of sexual abuse in girls was 8-31% and in males it was 3-17% [11]. Recent large scale cross-sectional studies on the prevalence of cyber abuse demonstrate that this is a growing problem, in which commonly recognized forms of child maltreatment (sexual and emotional abuse) are being pursued via the Internet [12-16]. Recent research has shown that cyber dating abuse and other forms of adolescent relationship abuse frequently overlap. Using a school based sample of adolescents, Zweig *et al.* [17] found that 26% of adolescents in dating relationships experienced cyber dating abuse and it was highly correlated with experiencing physical dating violence, psychological dating abuse, and sexual coercion. It is showed that cyber abuse and other types of abuse especially sexual abuse is related to each other, however very few reports have explored possible links between sexual abuse and cyber abuse

yet [18].

Understanding that cyber abuse may be a risk factor for sexual abuse and correlates of cyber abuse in this sample may guide prevention to reduce such abuse and possible sexual abuse and help improve children and adolescents health.

METHODS

Our research team included three members – the authors. We assessed 75 children and adolescents aged 7-18 who had experienced sexual abuse and were referred to us between 01.01.2014-01.01.2015. Additionally, 45 typical developing subjects who did not have any abuse history were recruited from pediatrics clinic of or hospital as the control group. Inclusion criteria for both groups were: i) clinically no mental retardation; ii) children living in their own family house iii) no history of psychiatric diagnosis; vi) no neurological or other serious medical diseases. Written consent was obtained from parents and verbal assent was requested from children and adolescents to participate. After the study, the patients were followed up in our polyclinic.

We used our semi-structured questionnaire to assess cyber abuse. In our country, there is no questionnaire to assess all types of cyber abuse. Therefore, we constructed our questionnaire to assess cyber abuse in children and adolescents.

Our questionnaire includes three sections. The first section includes information about sociodemographic characteristics. The second section includes information about sexual abuse for only children and adolescents who were sexually abused. The third section includes information about cyber abuse. Table 1 shows the questionnaire on cyber abuse. The types of cyber abuse were explained by our research team. This study was approved by the Ethics Committee of Erciyes University. Written consent was obtained from parents and verbal assent was requested from children and adolescents to participate.

Statistical Analysis

We used the Shapiro-Wilk test to analyze homogeneity of variables. Among-group differences on demographic variables were analyzed using the

Table 1. Third section of our questionnaire about cyber abuse

Do you use the internet?	0. No 1. Yes
Which tool do you use most frequently for accessing the internet?	1. Own mobile phone 2. Computer 3. Tablet 4. Other's phone 5. Cafe etc.
Have you ever been abused via cyber media?	0. No 1. Yes
Which type of cyber abuse were you exposed to?	1. Cyberbullying 2. Cyberstalking 3. Cyber sexual solicitation 4. Pornography
Who were you abused by?	1. Real friend 2. Someone you know before 3. Stranger
How many times were you abused?	1. 1 2. 2-4 3. More than 5
Have you ever abused any person via cyber media?	0. No 1. Yes
Which type of cyber abuse do you perform?	1. Cyberbullying 2. Cyberstalking 3. Cyber sexual solicitation 4. Pornography
How were you affected after you were cyber abused? (After this event, is there any change in your thoughts, feelings or your daily life?)	1. No effect 2. Short-term effect (<1 month) 3. Long-term effect (>1 month) 4. Result in sexual abuse

Mann-Whitney U test and the Independent Sample-t test. Associations between categorical variables were examined using Chi-Square Fisher-Exact analysis. Data analysis was performed using SPSS 21.0 and p values < 0.05 were considered statistically significant.

RESULTS

The sexual abuse and control groups were matched in terms of gender ratio. As shown in Table 2, there were no significant differences in mean of age, substance use, mean age of fathers, tobacco use of fathers, alcohol/substance use of mothers and fathers, father's psychiatric disorder and family situation. There were significant differences in tobacco use, mean age of mothers, the age of the mother when the child was born, any psychiatric disorder in the mother, mean year of mother's education and tobacco use of mother.

Demographics of sexually abused group

The demographic characteristics of the sexually abused group can be found in Table 3.

Variables and differences associated with abuse

Table 4 shows the differences of variables associated with abuse that are statistically significant ($p < 0.05$). The variables include physical abuse, perpetrator of physical abuse, perpetrator of emotional abuse, use of internet, the most used web site/application, gender ratio of cyber abuse and perpetrator of cyber abuse and were found to be statistically significant between groups.

DISCUSSION

There is a growing body of research on cyber abuse of children and adolescents [3, 19, 20]. However, to the best of our knowledge, there is only

Table 2. Demographic characteristics of both groups

Sociodemographic variables		Sexually abused group (n = 75)	Control group (n = 45)	Statistical significance
Age (years)		13.16 ± 2.64	13.22±3.52	F = 1,85 p = 0.372
Gender	Female	65 (86.7%)	39 (86.7%)	X ² = 0 p = 1
	Male	10 (13.3%)	6 (13.3%)	
Tobacco use	Yes	17 (22.7%)	1 (2.2%)	X ² = 9.22 p = 0.002*
	No	58 (77.3%)	44 (97.8%)	
Substance use	Yes	5 (6.7%)	-	X ² = 3.13 p = 0.156
	No	70 (93.3%)	45 (100%)	
Mean age of mother (years)		37.9 ± 6.12	40.11 ± 5.75	F = 2.06 p = 0.020*
The age of mother when child born (years)		24.75 ± 5.97	26.8 ± 5.38	F = 2.03 p = 0.028*
Any psychiatric disorder in mother	No	51 (69.9%)	40 (88.9)	X ² = 5.72 p = 0.05*
	Maybe	5 (6.8%)	1 (2.2)	
	Yes	17 (23.3%)	4 (8.8)	
Mean duration of mother's education (in years)	0-1	8 (10.7%)	4 (8.9)	X ² = 12.23 p = 0.016*
	2-5	48 (64.0%)	19 (42.2)	
	6-8	6 (8%)	11 (24.4)	
	9-11	10 (13.3%)	4 (8.9)	
	more than 11	3 (4%)	7 (15.6)	
Tobacco use of mother	Yes	32 (42.7%)	11 (24.4%)	X ² = 4.52 p = 0.048*
	No	42 (56%)	34 (75.6%)	
Alcohol/substance use of mother	Yes	2 (2.7%)	-	X ² = 1.25 p = 0.52
	No	73(97.3%)	45 (100%)	
Mean age of father		43.04 ± 9.57	43.97 ± 6.15	F = 1.93 p = 0.139
Mean duration of father's education (in years)	0-1	3 (4.1%)	-	X ² = 2.06 p = 0.72
	2-5	26 (39.2%)	15 (33.3%)	
	6-8	16 (21.6%)	9 (20%)	
	8-11	21 (28.4%)	12 (26.7%)	
	more than 11	8 (10.9%)	9 (20%)	
Any psychiatric disorder of father	Yes	63 (85.1%)	42 (93.3%)	X ² = 3.01 p = 0.22
	No	8 (10.8%)	1 (2.2%)	
	Maybe	3 (4.1%)	2 (4.4%)	
Tobacco use of father	Yes	52 (69.3%)	29 (64.4%)	X ² = 0.374 p = 0.55
	No	23 (30.6%)	16 (35.6%)	
Alcohol/substance use of father	Yes	6 (8%)	2 (4.4%)	X ² = 0.62 p = 0.70
	No	69 (92%)	43 (95.6%)	
Family situation	Both parents	56 (74.6%)	39 (86.7%)	X ² = 10.3 p = 0.32
	Divorced- living with mother	9 (12%)	2 (4.4%)	
	Divorced-livinig with father	5 (6.6%)	-	
	Mother dead- living with father	1 (1.3%)	-	
	Father dead- living with mother	2 (2.7%)	4 (8.9%)	
	Adopted	1 (1.3%)	-	
	Living with grandparents	1 (1.3%)	-	

Data are shown as mean±standard deviation or number (%).

Table 3. Demographic characteristics of sexual abused group

Sociodemographic variables		Data (n = 75)
Mean age of abused (years)		12.42 ± 2.78
Gender	Female	86.7%
	Male	13.3%
Abuser	Boy friend	26 (34.6%)
	Someone you know before	16 (21.3%)
	A friend	11 (14.7%)
	Stranger	9 (12%)
	Father	5 (6.7%)
	Relative	5 (6.7%)
	Teacher/School manager	3 (4%)
Mean age of abuser (years)		27.5 ± 12.7
Type of abuse	Nonpenetran	40 (%53.3)
	Anal penetration	13 (%17.3)
	Vaginal penetration	19 (%25.3)
	Oral penetration	3 (%4)
Repeated abuse	No	44 (58.7%)
	1-3	13 (17.3%)
	4-6	10 (13.3%)
	7 and more	8 (10.7%)
More than one abuser	No	71 (94.7%)
	Yes	4 (5.3%)
Marital status of abuser	Single	34 (45.3%)
	Married	18 (24%)
	Divorced	5 (6.7%)
	Unknown	18 (24%)
Way of meet with abuser person	No	9 (12%)
	Relative	12 (16%)
	School	10 (13.3%)
	Family friend	4 (5.3%)
	Neighborhood	23 (30.7%)
	Via Friends	11 (14.7%)
	Via internet	6 (8%)

Data are shown as mean ± standard deviation or number (%).

one study investigating the relationship between sexual abuse and cyber abuse in the literature [18]. The aim of the present study was to detect cyber abuse prevalence in sexual abuse cases, to identify whether internet use is a risk factor for sexual abuse in children by retrospectively reviewing internet use and cyber abuse in victims of sexual abuse and to determine the differences in internet use between healthy populations and children exposed to sexual abuse.

When sociodemographic differences were assessed between the sexual abuse group and controls, smoking rate was found to be significantly higher in

the sexual abuse group than in controls. In previous studies, it was shown that smoking rate was increased by childhood physical and sexual abuse [21]. In our study, no definitive conclusion could be made on smoking status since we did not ask whether smoking behavior began before or after sexual abuse.

Another important difference in sociodemographic findings was younger maternal age and lower age when child born in the sexual abuse group. In a longitudinal study by Brown *et al.* [22], a positive association was found between maternal youth and occurrence of sexual abuse. In another

Table 4. Variables and differences associated with abuse

Variables associated with abuse		Sexually abused group	Control group	Statistical significance
Physical abuse	Yes	19 (25.3%)	5 (11.1%)	$X^2 = 3.687$ $p < 0.05^*$
	No	56 (74.7%)	40 (88.9%)	
Perpetrator of physical abuse	Mother	6 (31.6%)	1 (20%)	$X^2 = 8.40$ $p = 0.03^*$
	Father	12 (63.2%)	2 (40%)	
	Mother and Father	1 (5.3%)	-	
	Brothers	-	2 (40%)	
Victim of physical abuse	Only child	12 (63.2%)	3 (60%)	$X^2 = 0.35$ $p = 0.83$
	Only mother	1 (5.3%)	-	
	Child and mother	6 (31.6%)	2 (40%)	
Neglect	Yes	3 (4.1%)	-	$X^2 = 1.87$ $p = 0.17$
	No	72 (95.9%)	45 (100%)	
Emotional abuse	No	62 (82.4%)	41 (91.1%)	$X^2 = 1.72$ $p = 0.19$
	Yes	13 (17.6%)	4 (8.9%)	
Perpetrator of emotional abuse	Father	4 (30.8%)	2 (50%)	$X^2 = 5.88$ $p < 0.05^*$
	Mother	8 (61.5%)	-	
	Brother/sister	1 (7.7%)	2 (50%)	
Use of internet	Yes	62 (82.7%)	44 (97.8%)	$X^2 = 6.23$ $p = 0.01^*$
	No	13 (17.3%)	1 (2.2%)	
The most used tool for internet	Own mobile phone	29 (46.8%)	21 (47.7%)	$X^2 = 6.53$ $p = 0.16$
	Computer	21 (33.9%)	10 (22.7%)	
	Tablet	1 (1.6%)	3 (6.8%)	
	Other's phone	8 (12.9%)	10 (22.7%)	
	Cafe etc.	3 (4.8%)	-	
The most used web site/application	Facebook	43 (69.4%)	9 (20.5%)	$X^2 = 39.65$ $p < 0.001^*$
	Instagram	1 (1.6%)	7 (15.9%)	
	Twitter	-	1 (2.3%)	
	Whatsapp/tango	-	9 (20.5%)	
	You tube	7 (11.3%)	4 (9.1%)	
	Game web sites	10 (16.1%)	8 (18.2%)	
	Surfing on the internet	1 (1.6%)	6 (13.6%)	
Cyber abuse	Yes	26 (35.1%)	14 (31.1%)	$X^2 = 0.16$ $p = 0.68$
	No	49 (64.9%)	31 (68.9%)	
Gender ratio of cyber abuse (female/male)	Yes	24/2	14/-	$X^2 = 3.60$ $p < 0.05^*$
	No	41/8	25/6	
Type of cyber abuse	Cyberbullying	6 (23.1%)	5 (35.7%)	$X^2 = 0.62$ $p = 0.1$
	Cyberstalking	11 (42.3%)	9 (64.3%)	
	Cyber sexual solicitation	5 (19.2%)	-	
	Pornography	4 (15.4%)	-	
	More than one type	-	-	
Perpetrator of cyber abuse	Real friend	2 (8%)	5 (35.7%)	$X^2 = 6.25$ $p = 0.044^*$
	Someone you know	4 (16%)	-	
	Stranger	20 (76%)	9 (64.3%)	
The number of cyber abuse	1	4 (15.4%)	1 (7.1%)	$X^2 = 2.70$ $p = 0.25$
	2-4	14 (53.8%)	4 (28.5%)	
	More than 5	8 (30.8%)	9 (74.4%)	
The effect of cyber abuse	No effect	13 (50%)	9 (64.3%)	$X^2 = 3.80$ $p = 0.14$
	Short-term effect	7 (26.9%)	5 (35.7%)	
	Long-term effect	-	-	
	Result in sexual abuse	6 (23.1%)	-	

Data are shown as number (%).

study, Mian *et al.* [23] found that the mothers of victims were younger than the mothers of nonvictims. In the literature, maternal age is defined as a risk factor for sexual abuse and our findings are in agreement with the literature.

In our study, we also found that maternal educational level was lower and maternal smoking rate was higher in the sexual abuse group when compared to controls. In many studies, it was found that maternal education was negatively correlated with the occurrence of child sexual abuse [24-26]. It is showed that in a study, the children of women who smoked during pregnancy were exposed to higher levels of social disadvantage, parental deviance, and family dysfunction throughout childhood compared with the children of women who did not smoke during pregnancy. Mothers who smoked during pregnancy were younger, less well educated, and of a lower socioeconomic status compared with nonsmoking mothers [27]. These factors related to mother's smoking is known that associated with child abuse and thus, it was thought that smoking of the mother could indirectly affect the sexual abuse of the child through these factors.

The prevalence of psychiatric disorders of mothers were found higher in the sexually abused group than control group. It is shown that maternal mental health problems increased the risk for child sexual abuse in some studies [28, 29]. Our result was consistent with these studies.

In our study, no significant difference was found in terms of emotional abuse between groups; however, it is striking that offenders in terms of emotional abuse were more commonly the mother in the sexual abuse group, reaching statistical significance when compared to the controls. In many of the studies that examined a hypothesized relationship between sexual abuse status and maternal sensitivity, or closeness with the mother, most had significant findings. In the majority of these studies, it was found that mothers who have closer, more positive relationships with their children are less likely to have children who are sexually abused [28, 30-32]. Studies conducted in adolescents victims of sexual abuse showed that support from the nonoffending parent (the mother in the majority of cases is strong), has been identified as playing a crucial role in influencing outcomes in survivors as well as their capacity to cope with later

adverse life events or potentially abusive situations [33]. It seems that maternal support is a protective factor that serves as a barrier for negative outcomes and decreases the risk for repeated victimization of these vulnerable youth.

When internet use was compared between groups, it were higher in the control group (97.8%) compared to those of the sexually abused group teens (82.7%). However, no significant difference were found in the rate of exposure to cyber abuse. The lack of significant difference in cyber abuse while the rate of internet use was lower indicates that rates of exposure to cyber abuse/internet use were higher in the sexual abuse group. In the recent study of Hebert *et al.* [18], they found that twice as many sexually abused girls experienced cyberbullying (33.47%) compared to nonsexually abused girls (17.75%) and a similar ratio was observed for boys (29.62 vs. 13.29%). The results of that study and our study show that cyber abuse is a major concern that affects a significant proportion of teenagers, in particular those who are more vulnerable, namely victims of child sexual abuse. These results can be explained by the fact that sexually abused adolescents are more likely to experience subsequent sexual, psychological, and physical victimization, whether it be in the context of romantic relationships or other types of interpersonal relationships [34, 35]. Previous studies have shown that the period following sexual abuse may translate into a sense of betrayal, shame, stigmatization, associated with a significant impact on interpersonal functioning which in turn may lead to increased vulnerability to revictimization [36, 37].

When the frequency of exposure to cyber abuse was assessed, 2-4 times was most common in both groups. In the national youth internet safety study of Ybarra *et al.* [38], the authors found that thirty-two percent of internet using young people aged 10-17 reported chronic harassment (such as ≥ 3 times during the prior year). The higher rates found in our study were interpreted as showing that the rate has increased in recent years [38].

One of the most striking findings was the difference in web pages/applications used by groups. Facebook was the most commonly used web page/application in 70% of subjects in the sexual abuse group while there was balanced distribution in the use of web pages/applications in the control group.

Facebook is a social network that has increased its number of users in recent years. This social network provides attractive communication and interaction opportunities to the user. Millions of people including teenagers and elders intentionally use Facebook to find friends, a romantic relationship or work and for communication. However, Facebook encourages but does not force its users to share personal information such as birthday, mobile phone number or place of residence. Sharing personal information on Facebook paves the way for cyber abuse by violation of private life via stealing personal data, documents, pictures and videos [39]. Likewise, using the Internet for social media, instant messaging, blogging, and chat room use increases the odds of being a target of Internet harassment versus those who do not engage in these online activities [38, 40]. In particular, excessive personal information available on social networks such as Facebook and Twitter can lead the more cyber abuse [40].

In our study, it was seen that the offenders were mostly an unfamiliar person in the sexual abuse group. It is known that adolescents were found to easily develop both friendships and romantic relationships online, relationships that were highly valued and considered as important as in real life relationships [41]. Also in adolescents, the use of emails and messages was reported by 50.7% in a romantic relationship [42]. It is thought that more common use of Facebook where personal information can be accessed by friends as well as unfamiliar persons led to cyber abuse by unfamiliar offenders [39]. In summary, electronic communication technology could create new opportunities for abuse and new victims and/or perpetrators of sexual abuse through cyber abuse [43].

It was seen in both groups that children and adolescents do not feel high levels of distress due to cyber abuse. In the national youth internet safety study of Ybarra *et al* they found that 38% of the harassed youth reported distress as a result of the incident [38]. In our study, this rate was 35.7% in the control group and 26.9% in the sexual abuse group. Ybarra *et al*. [38], also examined the factors related to emotional distress and they showed that children and adolescents who were targeted by adults, asked to send a picture of themselves, received an aggressive offline contact

(eg, the harasser telephoned or came to the young person's home), and were preadolescents were each significantly more likely to report distress because of the experience. Conversely, those who visited chat rooms were significantly less likely to be distressed by harassment [38].

It was found that cyber abuse resulted in sexual abuse in 6 subjects (23.1%) in the sexual abuse group. To the best of our knowledge, there is no study reporting such a rate in the literature but as a similar in community sample, Zweig *et al*. [17] found that, 11% of adolescents between 12-18 years, reported experience of sexual cyber dating violence. However, it is thought that the prevention of cyber abuse will be effective in preventing sexual abuse.

Our study has some limitations including its small sample size due to its being a single center study, lack of a validated and reliable scale.

CONCLUSION

In conclusion, we assessed cyber abuse in a population exposed to sexual abuse. As several authors have previously emphasized, the implementation of preventative steps is essential. There is a great need to develop and evaluate interventions with those children and young people, particularly in sexually abused children and adolescents who are thought to be more vulnerable to cyber abuse. Additionally, the importance of educating parents, caregivers and teachers about the potential risks associated with online activities must be emphasized. Parents need to become more knowledgeable about the risks presented by the Internet. Parents and other significant adults in children's lives also require effective strategies to engage with their children regarding online activity. Although little clinical knowledge appears to exist in this area, the growing nature of this phenomenon demands greater attention. Further research is also necessary to explore the impact of cyber abuse on sexual abuse and prevention strategies.

Authors contribution

MCU, SO and ED assessed the patients. MCU wrote the article, SO and ED review the article. All authors read and approved the final manuscript.

Conflict of interest

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