

Prevalence, Forms, and Predictors of Cyberbullying Perpetration

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SUMMARY

With the spread of social interactions from the physical into the “electronic world”, a new form of bullying has emerged among children and young people – cyberbullying. Cyberbullying is bullying through the use of information and communication technologies. Given that the safety of children on the Internet is one of the main preoccupations of parents, educational experts and the media in the digital age, in this paper we investigate the prevalence rate, forms and predictors that encourage children to commit this type of bullying. The research was conducted by surveying 269 students (5th and 8th graders), from two elementary schools in Zagreb. The results show that in the last two months 24,5 % of students found themselves in the role of cyberbullies, that the most common forms of this behaviour are saying ugly things, mocking, and ignoring others on social media platforms, and that its most important predictors are traditional bullying perpetration, affirmative attitude towards violence, cyberbullying victimization, poorer school performance and authoritarian parenting. The authors conclude that the key to preventing cyberbullying lies in the cooperation of educational experts, students, parents and the media, as well as their adaptation to the changing cyber environment.

Keywords: cyberbullying, electronic media, multiple regression analysis, predictors, prevention

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Introduction

The last few decades have been marked by the rapid development of information and communication technologies. The daily use of electronic media has become an integral part of the lives of a large number of people, especially children and young people who use them for various purposes and for whom they have become the dominant place for socialization and obtaining information. However, despite the numerous advantages, new “online risks” have come with them (Divić and Jolić, 2019: 268). With the spread of social interactions from the

comphysical to the “electronic world”, a new form of bullying has emerged among children, which is realized through media such as mobile phones, social networks, e-mails, etc. To children who are unable to achieve supremacy in the “real world” for various reasons, cyber environment becomes a “parallel world” in which they express their power over peers. Traditional peer bullying, therefore, transitions into cyberbullying (Velki and Kuterovac Jagodić, 2016). The safety of children on the Internet is one of the main preoccupations of parents, educational experts and the media in the digital age, so in this paper we will present and discuss the results of research on the prevalence and forms of cyberbullying among 5th and 8th grade students from two elementary schools in Zagreb, and since the detection of factors that lead to such behaviour is a crucial for its early suppression and prevention, we will pay special attention to the predictors of this form of bullying. Although the literature sometimes deals with both perpetration and victimization, in this paper we will primarily focus on *cyberbullying perpetration*, while we will view victimization as a part of its predictor set. This is because we wish to use this paper for a thorough empirical analysis of a phenomenon that we consider important because the prevention of (cyber)bullying consequently leads to a reduction in victimization.

Theoretical starting points of the paper

It is not easy to answer why individual children become perpetrators or victims of (cyber)bullying. *Routine activity theory* (Cohen and Felson, 1979) assumes that bullying occurs when elements of a motivated perpetrator (one who is prone to perpetrating unacceptable actions), appropriate target (one who is perceived as a suitable victim) and the absence of an adult caregiver or adequate protection to prevent such treatment are cumulatively present. *Social dominance theory* (Swearer et al., 2006) also contributes to the explanation of children’s bullying perpetration, and assumes that the transition from lower to higher grades of elementary school, as well as the transition from elementary to secondary school, requires adolescents to confirm

their dominance in relationships, i.e. fight for position and achieve status within the reference group. Peer bullying is a complex phenomenon and despite the different theoretical approaches, two of which we have just mentioned, none fully explains it.

Concept, forms, and characteristics of (cyber)bullying

When it comes to peer bullying, it is important to distinguish *bullying* from *abuse*. Olweus (1998) defines bullying as a malicious, hostile, repetitive, or persistent behaviour of one or more students, who are often physically stronger, more agile, or socially and psychologically more powerful, whose goal is to cause physical and emotional harm and suffering to a victim. Abuse includes *all* of the elements listed in the previous definition – aggression, repetition and imbalance of power. If it is not possible to determine all three criteria, then we talk about bullying. Bullying is, therefore, a broader concept than abuse and can manifest in different ways.

Electronic media provided children with a new context for bullying their peers and led to the emergence of the so-called *cyberbullying*. Given that this is a relatively modern phenomenon, there is still no generally accepted definition for it. Hinduja and Patchin (2009: 5) provide one possible definition, defining it as “wilful and repeated harm inflicted through the use of computers, cell phones, and other electronic devices”. Cyberbullying can take various forms of behaviour, such as: insulting, harassing, gossiping, and slandering through messages, designing and creating websites that contain stories, drawings, pictures and jokes at the expense of peers, theft of electronic identity, sexting, video recording of bullying, etc. (Bilić, 2018). These forms of bullying often occur at the same time. Like traditional, cyberbullying is also characterized by aggression, repetition and imbalance of power. However, it is worth noting certain specifics of this form of bullying.

Anonymity. Anonymity can result in bullies not perceiving their behaviour as bullying (Đuraković et al., 2014). Bullies “do not see the person they are harming, nor the consequences of such behaviour, thus maintaining emotional distance and showing a lack of empathic reactions” (Ovejero et al., 2015 quoted in Vejmelka et al., 2017: 61).

Dominance. Dominance is manifested in cyber environment through “controlling topics in online discussions, causing conflicts by sending inappropriate messages and higher status in electronic communities” (Menesini and Nocentini, 2009 quoted in Vejmelka et al., 2017: 62). Children who are more qualified to use electronic media in a way that allows them to harass others are in a position of power over others.

Repeat offenses. Repeat offenses in cyberbullying refer to the number of times con-

tent is viewed or forwarded (Vandebosch and Van Cleemput, 2008). Although posting content with the aim of belittling is a one-time act, any new comment, view, and similar action may lead to a repeated experience for victims.

Actors and consequences of (cyber)bullying

Although there are broader categorizations, within peer bullying, apart those who do not participate in it, three types of actors are most often mentioned.

Bullies. Cyberbullies are “individuals who engage in harmful behaviour through communication technologies (e.g. mobile phone or a computer)” (Smith et al., 2008: 376). They use electronic media to degrade those they consider inferior and / or to demonstrate their technological skills and power (Vandebosch and Van Cleemput, 2008).

Victims. Cybervictims are “individuals who have experienced harmful behaviour through communication technologies” (Arıcak, 2011 quoted in Ateş et al., 2018: 104). Compared to traditional bullying, it is possible to reach many more children via electronic media (e.g. children from other schools or even cities) (Velki and Kuterovac Jagodić, 2016). Given this, we can conclude that today every child who has access to the Internet is a potential victim.

Victims / bullies. It is important to mention those who are victims of bullying, but at the same time, they themselves act as bullies. Children who experience bullying are at greater risk of harassing others in retaliation, i.e. of behaving violently to deal with feelings of accumulated helplessness and frustration (Hemphill et al., 2012).

Cyberbullying leads to a number of negative consequences (Ateş et al., 2018), both for the victim and the bullies. These consequences can be grouped into three categories: *psychological* (e.g. depression, suicidal thoughts, aggression), *social* (e.g. social anxiety, intolerance, poor relationships) and *physical* (e.g. substance abuse, insomnia, hyperactivity) (Sesar, 2011). Given the context in which we conducted this research, we should also note those *closely related to school* (e.g. poor performance, increased absenteeism, lack of motivation).

Prevalence and predictors of cyberbullying perpetration

Interest in the topic of cyberbullying has been very widespread in recent years, but the results of the research are difficult to compare due to different criteria in defining cyberbullying, as well as different instruments used to measure it. Ronis and Slaunwhite (2017), for example, found that the proportion of cyberbullies ranges

between 8,0 % to 33,7 %. If we stick to Croatian geographical context, a recent study by Pavičić Vukičević et al. (2019) indicates that more than 80,0 % of students have experience with creating websites that contain stories, drawings, pictures and jokes at the expense of peers, breaking into other people's profiles on social networks, as well as with malicious writing of negative comments, although it is not stated in which role – as bullies or victims.

Although (cyber)bullying is often attributed to imitation of the elderly, escape from reality, one's own problems, undeveloped awareness and responsibility for one's own actions (Mandarić, 2012), the reality is far more complex. Dozens of papers on this topic have been published in the last three decades, confirming that (cyber)bullying occurs as a result of numerous conditions (predictors). A detailed analysis of all predictors would go beyond the scope and objectives of this paper, so we will briefly discuss only those most frequently mentioned in recent domestic and international research.

(Inter)relationship between traditional and cyberbullying. Research unequivocally indicate that the traditional bullying perpetration is stable and one of the most significant predictors of cyberbullying perpetration (Del Rey et al., 2012; Hemphill and Heerde, 2014; Lee and Shin, 2017). This implies that children who are bullies in the “real world” are more likely to be bullies in the “electronic world” as well.

(Inter)relationship between cyberbullying perpetration and cyberbullying victimization. Recent research (Beyazit et al., 2017; Lee and Shin, 2017; Velki and Kuterovac Jagodić, 2016) show that cybervictims are more likely to become cyberbullies themselves. In other words, victimization is an important predictor of cyberbullying.

Attitude towards violence. Normative beliefs and attitudes of children are associated with aggressive behaviour and traditional forms of bullying; children who have an affirmative attitude towards violence and bullies are more likely to bully others. Research by Elledge et al (2013) found that children who have a negative attitude towards violence are less likely to become cyberbullies, while Heirman and Walrave (2012) found a positive relationship between children's affirmative attitude towards cyberbullying and their propensity to perpetrate it.

Sex. The results of recent research unequivocally indicate that boys are overrepresented as cyberbullies (Beyazit et al., 2017; Divić and Jolić, 2019; Hemphill and Heerde, 2014; Lee and Shin, 2017; Marjanović, 2016; Ronis and Slaunwhite, 2017).

Age. Traditional bullying most often occurs in the period from 4th to 8th grade (Sesar, 2011). Domestic research (Buljan Flander et al., 2007; Velki, 2012 all quoted in Velki and Kuterovac Jagodić, 2016) show that most cyberbullying behaviour is shown by students in the final grades of elementary school. Bannink et al. (2014

quoted in Beyazit et al., 2017: 1517) suggest that “cyberbullying intensifies at the age of 14 because adolescents then spend more time on their cell phones and are more likely to visit websites and use social networks, which are considered to be the most common places of bullying”.

Poor school performance. Poor school performance is a risk factor for traditional bullying and recent research (Divić and Jolić, 2019; Hemphill and Heerde, 2014; Marjanović, 2016) indicate a similar trend in cyberbullying.

Internet access. The results of the HR Kids Online (2017) survey show that as many as 93,0 % of children in Croatia own a mobile device, while most of them have Internet access whenever they want. Research (Otrar and Ökte, 2014; Sourander et al., 2010 all quoted in Beyazit et al., 2017) show that children with unrestricted Internet access are more likely to become cyberbullies.

Time spent online. Recent research (Divić and Jolić, 2019; Lee and Shin, 2017) show that a greater amount of time spent in online activities is positively correlated with participation in cyberbullying, both as a victim and as a perpetrator.

Supervision / control. “Electronic media can be an opportune space for a motivated bully due to lack of control over technology and interactions in relation to potential barriers in the real world” (Espelage et al., 2013 quoted in Vejmelka et al., 2017: 62). Recent research (Beyazit et al., 2017; Nocentini et al., 2018) confirm that cyberbullies more often come from families in which parental supervision is lacking.

Family conflicts. Family conflicts are a stable predictor of physical aggression and traditional bullying among children. Research (Hemphill and Heerde, 2014; Hinduja and Patchin, 2009) confirm the same with regard to cyberbullying – children who come from families burdened with frequent conflicts are more likely to be perpetrators of this type of bullying.

Parenting style. Children who are traditional bullies often come from families in which parents frequently punish, threaten and use coercion and power to establish discipline (Martinez, 2019; Sesar, 2011). In such families, children learn that bullying is an appropriate way to resolve conflicts and transfer the learned behaviour to relationships with peers.

Objectives, purpose and hypotheses of the paper

The general objective of this paper is to determine the prevalence and the forms of cyberbullying perpetration among 5th and 8th grade students from two elementary schools in Zagreb.

The specific objective of this paper is to determine the extent to which students' propensity to cyberbullying perpetration is conditioned by traditional bullying perpetration and victimization, their attitude towards violence as well as other selected individual characteristics.

The purpose of this paper can be seen in scientific cognitions that can be used to act in practice, i.e. as guidelines for designing educational and preventive strategies of pedagogical intervention, work on (re)shaping social ties and relationships, dealing with crisis situations and designing media campaigns aimed at the prevention of (cyber)bullying.

With an objective of determining conditions that lead to cyberbullying perpetration, in accordance with the conceptual assumptions and results of previous research, the *hypotheses* that will be tested in this paper are:

- Students more prone to traditional bullying perpetration are more prone to cyberbullying perpetration (H_1)
- Students' propensities to perpetrate and experience cyberbullying are positively correlated (H_2)
- Students who have a more affirmative attitude towards violence are more prone to cyberbullying perpetration (H_3)
- Male students are more prone to cyberbullying perpetration than female students (H_4)
- 8th grade students are more prone to cyberbullying perpetration than 5th grade students (H_5)
- Students with poorer school performance are more prone to cyberbullying perpetration (H_6)
- Students who come from families where an authoritarian parenting predominates are more prone to cyberbullying perpetration (H_7)

Methodology

Measuring instruments and variables

The questionnaire used in this research is a combination of measuring instruments and variables from different sources. The questionnaire consisted of a total of 15 questions, i.e. 58 variables. Their descriptions and sources are listed below.

Cyberbullying was measured by modification¹ of the *European Cyberbullying Intervention Project Questionnaire (ECIPQ)*, which was constructed and validated

in the research of Del Rey et al. (2015) and Herrera-López et al. (2017). Before using the instrument, we requested and obtained (electronic) authorization of the authors for its use. The original instrument consists of 22 Likert-type items, i.e. two subscales of 11 items that were used in this study as independent scales to measure the same behaviours – the first from the perspective of a cyberbully, and the second from the perspective of a cybervictim. Accordingly, we named the scales the Cyberbullying Perpetration Scale (hereinafter CBPS in tables) and the Cyberbullying Victimization Scale (hereinafter CBVS in tables). The first scale was, in accordance with the research topic, used as a criterion in the paper. As part of the introductory text of the instruments, we asked students to acknowledge how many times in the last two months they have perpetrated and experienced some form of cyberbullying. Following the example of previous research, we joined a five-point rating scale to each of the scales (ranging from 1 = »Not once«, to 5 = »Several times a week«). It should be noted that a higher score on the scales indicates a higher degree of cyberbullying perpetration, i.e., victimization.

Traditional bullying was measured by modification the *European Bullying Intervention Project Questionnaire (EBIPQ)*, which was also validated by Del Rey et al. (2012). The original instrument consists of 14 items, i.e. two subscales of 7 items each, which we also used as independent scales in this research, which we named the Traditional Bullying Perpetration Scale (hereinafter TBPS in tables) and the Traditional Bullying Victimization Scale (hereinafter TBVS in tables). As with cyberbullying scales, we asked students to acknowledge how many times they had perpetrated and experienced some form of traditional bullying.

Attitude towards violence was measured using 12 items, i.e. an abbreviated version of an instrument originally constructed by Rigby and Slee (1991). Following the example of Elledge et al. (2013), we joined a five-point rating scale to the scale (ranging from 1 = »I completely disagree« to 5 = »I completely agree«) and we named the scale the Attitude towards Violence Scale (hereinafter ATVS in tables).

All used scales showed optimal metric characteristics, which are presented in Table 1

Table 1 Scales' metric characteristics

Tablica 1. Metrijske karakteristike skala

Scale	No. of items	Cronbach's α	n	KMO	Bartlett (p)	No. of factors	% expl. variance
CBPS	11	0,96	267	0,94	< 0,001	1	71,3 %
CBVS	11	0,92	264	0,93	< 0,001	1	58,2 %
TBVS	7	0,85	265	0,86	< 0,001	1	52,9 %
TBPS	7	0,89	265	0,87	< 0,001	1	60,5 %
ATVS	12	0,90	255	0,91	< 0,001	2	57,4 %

Regarding individual characteristics of students, for the purposes of this research we +5' +9P' *they own a device with the Internet access, (6) the amount of time they spend on the Internet, (7) the degree of parental supervision, (8) the frequency of family conflicts, and the parenting style of (9) a father and (10) a mother.* The scale for the amount of time spent on the Internet ranged from 1 = »Less than 1 hour a day«, to 5 = »More than 6 hours a day«, the scale for the degree of parental supervision and the frequency of family conflicts ranged from 1 = »Never«, to 5 = »Constantly«, while the scale for assessing the parenting style ranged from 1 = »Very lenient«, to 5 = »Very strict«.

Research sample and implementation process

The research was conducted using a survey method, which is considered the "most reliable method for assessing bullying because it allows children to speak directly and anonymously about their experiences" (Baldry, 2003 quoted in Sesar, 2011: 511-512), in the period from December 2019 to January 2020, on the random sample of students from two elementary schools in Zagreb (Sesvete Elementary School and Luka Sesvete Elementary School), which we further stratified by *school, grade* and *sex*, to ensure the closest possible representation of students in the sample compared to the overall number of students in these schools. The survey was conducted face-to-face in groups, during class hours, with prior arrangement with class teachers, using pen and paper. After the final survey we counted and sorted the questionnaires according to school, grade, and sex, after which we dismissed as many questionnaires as needed to achieve sample stratification. The total n is 269 students² (see Table 2).

Table 2 Sample demographic structure

Tablica 2. Demografska struktura uzorka

	Sesvete Elementary School			Luka Sesvete Elementary School		
	Male	Female	Σ	Male	Female	Σ
5th Grade	32 52,0 %	30 48,0 %	62 100,0 %	30 45,0 %	36 55,0 %	66 100,0 %
8th Grade	42 58,0 %	31 42,0 %	73 100,0 %	37 54,0 %	31 46,0 %	68 100,0 %

Total n = 269

Since the survey was conducted on school premises, we requested and obtained a written consent of principals³ prior to conducting the research, and since it was conducted on minors, in accordance with the *Code of Ethics for Research with Children* (2003), one week in advance students were asked to, on the day of the survey, deliver the written *Consent to participate in the survey* signed by a parent or a guardian. In addition, before completing the questionnaire, students were verbally informed about the topic, objectives, and the purpose of the research, that their participation is completely anonymous and voluntary, that their personal data will not be recorded anywhere and that they can opt out at any time. In the event that students refused to participate in the research or when they did not bring signed *Consents*, we acted in agreement with the class teachers.

Statistical data analysis

Statistical data analysis was performed using the *IBM SPSS Statistics 24.0*. The collected data were first tested for reliability and dimensionality. They were then analysed using basic descriptive statistical indicators, followed by parametric (t-test and Pearson correlation coefficient) and nonparametric (hi-square test) tests of differences and correlations, while the central part of the paper consists of the results of multiple linear regression analysis.

Results and discussion

How much and how do students perpetrate cyberbullying?

When we look at the prevalence of cyberbullying perpetration, based on the set criteria,⁴ we came to the conclusion that in the last two months, 24,5 % of students found themselves in the role of a cyberbully of some type.

Prevalence, Forms, and Predictors of Cyberbullying Perpetration

Furthermore, when it comes to forms of cyberbullying, from Table 3 we can see that most students *said ugly things to others about someone via the Internet or mobile messages* ($\bar{x} = 1,80$), *ignored others on social networks or excluded them from group conversations* ($\bar{x} = 1,74$), i.e. *mocked or said ugly things to someone via the Internet or mobile messages* ($\bar{x} = 1,71$). On the other hand, the lowest percentage is of those who *posted private things about others on the Internet* ($\bar{x} = 1,28$).

Table 3 Descriptive indicators of Cyberbullying Perpetration Scale

Tablica 3. Deskriptivni pokazatelji Skale činjenja elektroničkog nasilja

FORM OF CYBERBULLYING PERPETRATION	Answer frequencies and percentages					Descriptive indicators	
	Not once	Once or twice	A few times	Approx. once a week	Several times a week	\bar{x}	s
i02: I said ugly things to others about someone via the Internet or mobile messages (e.g. that someone is fat or ugly)	128 47,6%	100 37,2%	20 7,4%	8 3,0%	13 4,8%	1,80	1,03
i10: I ignored someone on social media or excluded them from group conversations (e.g. I kicked them out of a class group)	136 50,6%	99 36,8%	14 5,2%	8 3,0%	12 4,5%	1,74	1,01
i01: I mocked or said ugly things to someone via the Internet or mobile messages (e.g. that they were fat or ugly)	148 55,0%	84 31,2%	13 4,8%	13 4,8%	10 3,7%	1,71	1,02
i08: I posted pictures or videos on the Internet that someone is ashamed of (e.g. a picture or video that made someone look bad)	184 68,4%	60 22,3%	14 5,2%	10 3,7%	1 0,4%	1,45	,80
i04: I hacked someone's profile on the Internet and read or watched their private things (e.g. on WhatsApp or Instagram)	190 70,6%	54 20,1%	13 4,8%	11 4,1%	1 0,4%	1,43	,79
i11: I spread lies about someone via the Internet or mobile messages (e.g. that they did something they did not)	203 75,5%	42 15,6%	8 3,0%	6 2,2%	10 3,7%	1,43	,94
i03: I threatened someone via the Internet or mobile messages (e.g. that I would beat them or reveal their secret)	198 73,6%	47 17,5%	10 3,7%	10 3,7%	3 1,1%	1,41	,82
i09: I edited pictures or videos that someone posted to make fun of them (e.g. I drew them a moustache or edited a video)	214 79,6%	34 12,6%	13 4,8%	7 2,6%	1 0,4%	1,32	,72
i05: I hacked into someone's profile on the Internet and pretended to be them (e.g. I sent messages to others on Instagram on their behalf)	210 78,1%	42 15,6%	11 4,1%	5 1,9%	1 0,4%	1,31	,67
i06: I created a fake profile on social media and pretended to be someone else (e.g. on Snapchat or Instagram)	212 78,8%	39 14,5%	11 4,1%	6 2,2%	1 0,4%	1,31	,69
i07: I posted private things about someone on the Internet (e.g. where they live or something about their family)	218 81,0%	32 11,9%	15 5,6%	4 1,5%	0 0,0%	1,28	,63

Based on these results, what do we conclude about the prevalence and forms of cyberbullying perpetration among students? The overall rate of 24,5 % of cyberbullies, although at the upper limit of the rates mentioned by Ronis and Slaunwhite (2017), should not be perceived as overly dramatic – we remind that a student was categorized a cyberbully even if he / she perpetrated only 1 of 11 forms of cyberbullying a few times. As we pointed out earlier, these rates are highly variable and depend on the definition criteria and measuring instrument used.

When it comes to forms of cyberbullying, our results correspond to the results of previous research, which showed that sending offensive messages or comments (Pavičić Vukičević et al., 2019), i.e. gossiping and spreading lies (Đuraković et al., 2014; Smith et al., 2008), are the most common forms of cyberbullying perpetration among children. Although the theoretical range of each item is between 1 and 5, and the average score on any item does not exceed 2, it should be emphasized that, given the phenomenon we investigated, we did not expect a normal distribution of results. Contrary, we expected the results to be exactly as they are – right skewed. However, this does not mean that schools should not make additional efforts to implement cyberbullying prevention programs. Despite the low average results, a certain number of students continuously perpetrate this form of bullying (e.g. 4,8 % of students *say ugly things to others about someone via the Internet or mobile messages* several times a week, while 4,5 % *ignore others on social networks or exclude them from group conversations*).

What motivates students to perpetrate cyberbullying?

Before performing multiple linear regression analysis, we checked the values of the Pearson correlation coefficients (hereinafter r) between the Cyberbullying Perpetration Scale (criterion) and other variables that we assumed could be its predictors. From Table 4 we see that the highest correlation coefficients with the criterion are observed for the Traditional Bullying Perpetration Scale ($r = 0,77$), the Attitude towards Violence Scale ($r = 0,72$) and the school performance ($r = -0,67$). To continue, we emphasize that only those variables that showed a statistically significant direct correlation with the Cyberbullying Perpetration Scale were included as predictors in the multiple regression analysis.

Table 4 Intercorrelations of all measured variables

Tablica 4. Interkorelacije svih mjenjenih varijabli

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1) CBPS	1														
2) CBVS	,33**	1													
3) TBVS	,06	,50**	1												
4) TBPS	,77**	,19**	,24**	1											
5) ATVS	,72**	-.02	-.06	,65**	1										
6) sex	-.21**	,10	,02	-.23**	-.31**	1									
7) school	,04	-.01	-.07	,02	-.04	,05	1								
8) grade	,41**	,24**	,00	,36**	,27**	-.08	-.03	1							
9) performance	-.67**	-.06	-.04	-.59**	-.62**	,31**	,05	-.46**	1						
10) access ⁵	,04	,01	,05	,03	,03	,12*	,04	-.08	,07	1					
11) time	,43**	,25**	,02	,39**	,38**	-.07	,03	,43**	-.44**	,06	1				
12) supervision	-.26**	,27**	,24**	-.24**	-.35**	,24**	-.03	-.32**	,34**	,04	-.14*	1			
13) quarrels	,59**	,21**	,13*	,56**	,51**	-.14*	-.02	,18**	-.45**	,06	,35**	-.07	1		
14) par_father	,62**	,04	,06	,43**	,44**	-.21**	-.03	,23**	-.43**	-.02	,15*	-.13*	,36**	1	
15) par_mother	,57**	-.04	-.02	,41**	,39**	-.13*	,06	,18**	-.37**	-.06	,14*	-.06	,29**	,70**	1

* $p < 0,05$; ** $p < 0,01$

In the analysis of cyberbullying perpetration predictors, when including and excluding predictor variables from the analysis, the *stepwise* method was used, which was carried out in five steps and five models were obtained (Tables 5 and 6). In the last (fifth) step / model, the highest value of adjusted coefficient of determination was obtained – 0,769, which means that 76,9 % of the total variance of cyberbullying perpetration is explained by the following five predictors: (1) *traditional bullying perpetration* ($\beta = 0,35$), (2) *attitude towards violence* ($\beta = 0,31$), (3) *cyberbullying victimization* ($\beta = 0,25$), (4) *school performance* ($\beta = -0,21$), and (5) *father's parenting style* ($\beta = 0,12$).

Table 5 Five models of multiple linear regression analysis with CBPS as a criterion

Tablica 5. Pet modela multiple linearne regresijske analize sa ŠCEN-om kao kriterijem

Model	R	R ²	Adj. R ²	Statistic of change				
				R ² change	F change	df1	df2	p (F change)
1	,77 ^a	,60	,60	,60	379,96	1	257	< 0,001
2	,82 ^b	,67	,67	,07	61,07	1	256	< 0,001
3	,86 ^c	,73	,73	,06	54,85	1	255	< 0,001
4	,87 ^d	,76	,76	,03	33,69	1	254	< 0,001
5	,88 ^e	,77	,77	,01	11,35	1	253	0,001

^a Predictors: (Constant), TBPS

^b Predictors: (Constant), TBPS, ATVS

^c Predictors: (Constant), TBPS, ATVS, CBVS

^d Predictors: (Constant), TBPS, ATVS, CBVS, performance

^e Predictors: (Constant), TBPS, ATVS, CBVS, performance, par_father

Table 6 Non-standardized and standardized β -coefficients of the fifth model of multiple linear regression analysis

Tablica 6. Nestandardizirani i standardizirani β -koeficijenti petog modela multiple linearne regresijske analize

Variable	Non-std. coefficients		Std. coefficients	t	p
	B	Std. deviation	β		
TBPS	0,50	0,06	0,35	7,97	< 0,001
ATVS	0,24	0,03	0,31	7,92	< 0,001
CBVS	0,25	0,03	0,25	7,07	< 0,001
performance	-2,27	0,44	-0,21	-5,21	< 0,001
par_father	0,56	0,17	0,12	3,37	0,001

What do these results imply and how do they correspond to the results of previous research and the hypotheses we set in the paper? First, we emphasize that, given the number of statistically significant predictors (five) within the final regression model, the percentage of explained variance of criterion (76,9 %) is very high, given that in social sciences complex phenomena are difficult to explain by a small numbers of predictor variables. This indicates that the conceptual assumptions of this phenomenon correspond to the real situation, i.e. the practice.

Let us start by looking at the relationship between traditional and cyberbullying. Between these two variables the highest direct correlation of all variables in the study was found ($r = 0,77$). Traditional bullying perpetration also makes the largest contribution within the final regression model ($\beta = 0,35$) and accordingly confirms the first hypothesis (H_1), as well as the findings of previous research (Del Rey et al., 2012; Hemphill and Heerde, 2014; Lee and Shin, 2017). This implies that children prone to bullying perpetration will do the same regardless of the context or location (“real” or “electronic world”), which can be related to an affirmative attitude towards violence which is also an important predictor of both traditional and cyberbullying.

When it comes to the relationship between cyberbullying perpetration and victimization, we see from Table 4 that a low ($r = 0,33$) but statistically significant positive correlation was found between these two phenomena, and cyberbullying victimization also proved to be a statistically significant predictor of perpetration of this type of bullying within the final regression model, thus confirming the second hypothesis (H_2). This confirms the findings of previous research (Beyazit et al., 2017; Lee and Shin, 2017; Velki and Kuterovac Jagodić, 2016) on victimization as an important predictor of (cyber)bullying perpetration. The explanation probably lies in the fact that victimized children, who are often weaker than their bullies and peers in the “real world”, express their frustrations (over others) in the “electronic world”, where physical strength is not the deciding factor.

As we have already mentioned, an (affirmative) attitude towards violence is an important predictor of cyberbullying perpetration. This variable has the second highest direct correlation with cyberbullying perpetration of all variables ($r = 0,72$), and it also entered the final regression model (within which it gives a significant contribution – $\beta = 0,31$), thus confirming the third hypothesis (H_3), as well as the findings of Elledge et al. (2013) and Heirman and Walrave (2012). It is in human nature to act in accordance with our normative beliefs, i.e. to act as we think is right. Children are no exception.

Furthermore, although we can see from Table 4 that a statistically significant negative correlation was found between sex and cyberbullying perpetration ($r = -0,21$),

this variable did not enter the final regression model, thus we formally reject the fourth hypothesis (H_4). However, the results still imply that male students are more likely to perpetrate this type of bullying,⁷ regardless of the fact that within the final regression model other variables proved to be stronger predictors, which can be explained by cultural-socialization approaches in education (e.g. more is tolerated to males who are sometimes even encouraged to be aggressive).

Research (Beyazit et al., 2017; Buljan Flander et al., 2007; Velki, 2012 all quoted in Velki and Kuterovac Jagodić, 2016) indicate that older children are more likely to become cyberbullies. Although the variable *grade* did not enter the final regression model, thus formally rejecting the fifth hypothesis (H_5), Table 4 shows that the grade that children attend is statistically significantly positively correlated with cyberbullying perpetration ($r = 0,41$), which implies that 8th grade students are more prone to cyberbullying perpetration.⁸ This is in line with the social dominance theory (Swearer et al., 2006), which assumes that children try to gain a reputation and position among peers by perpetrating violence, especially in the transition from classroom to subject teaching, i.e. from elementary to secondary school.

Next, we assumed a negative correlation between school performance and cyberbullying perpetration, which was confirmed ($r = -0,67$). School performance is also a predictor within the final regression model ($\beta = -0,21$), thus confirming the sixth hypothesis (H_6). These results correspond to those of Divić and Jolić (2019), Hemphill and Heerde (2014) and Marjanović (2016), and imply that school failure (or failure in general) and jealousy can be a major source of frustration in children, which can manifest in (cyber)bullying perpetration.

Finally the authoritarian parenting proved to be a statistically significant predictor of cyberbullying perpetration, both in direct correlation ($r = 0,65$) and within the final regression model (where, though, it gives the smallest contribution of all other predictors – $\beta = 0,12$), thus confirming the results of previous research (Martinez, 2019; Sesar, 2011) and the final (seventh) hypothesis (H_7). In families where parents often punish and practice aggressive parenting methods, children learn that bullying is an appropriate way of resolving conflicts, thus it is not surprising that some of them resolve conflicts with their peers by force.

Conclusion

This paper provides a conceptual and empirical insight into the issue of the phenomenon of cyberbullying (perpetration) among children. By applying a conceptually comprehensive set of predictors and a reliable criterion measuring instrument (Cy-

berbullying Perpetration Scale), we achieved the general and specific objective of the paper.

Given the many negative consequences of cyberbullying (perpetration), its prevention is a legal and ethical imperative, and its success requires the cooperation of several actors. The results of this research indicate a strong connection between the perpetration of traditional and cyberbullying, so we can assume that the existing prevention programs, which relate to traditional peer bullying, will have a certain effect on the suppression of cyberbullying. However, given the specifics of cyberbullying, it is necessary to implement in existing prevention programs elements that will aim to combat bullying that occurs outside the usual space-time frameworks. Furthermore, since cyberbullying victimization has proven to be an important predictor of cyberbullying, victims require timely assistance and support, whilst a relationship of trust between students and school staff should be encouraged. In addition, it is necessary to actively work on changing the consciousness of children in the direction of condemning bullying and bullies, while showing empathy towards victims, and there is a need for additional work with students who show lower school performance. In the latter, it is necessary to include not only educational experts, but also the students themselves who will strengthen class cohesion by helping their peers. Finally, in addition to children themselves, prevention activities should also include their parents, who have to be aware of the dangers of cyberbullying, and since its important predictor is an authoritarian parenting, they should be advised to resolve conflicts peacefully while respecting the child's autonomy, combined with setting clear boundaries and rules of conduct. Given the current circumstances caused by the COVID-19 pandemic, which, among other things, resulted in increased use of electronic media by children of all ages, it is necessary to encourage their responsible use, which should include the media themselves, who could reduce the potential for bullying in the electronic environment via technological solutions, regulation, and anti-bullying campaigns.

Although we believe that the results presented in this research are important and useful, it is necessary to point out certain limitations of this research. To begin with, it should be noted that data, as in most research on this topic, were collected based on students' self-statements, and this way of answering can sometimes be mitigated by socially desirable answers for fear of sanctions (although anonymity is guaranteed). Next, the research was conducted on a small sample, which prevents generalization to the entire population of fifth and eighth grade students. Furthermore, given the rapid development of technology and the changing cyber environment, it is possible that the criterion instrument used in the research did not cover all forms of behaviour that constitute cyberbullying. We also see a possible limitation in the

suppression of potential predictors of cyberbullying perpetration by traditional bullying perpetration. We see suggestions for future research on this topic in deepening quantitative findings with qualitative insights (interviews), as well as in research on a nationally representative sample, to confirm and supplement knowledge about conceptual and empirical relationships that are in the background of the researched phenomenon.

ENDNOTES

- ¹ The modification of ECIPQ and EBIPQ consisted of translating items from English to Croatian, as well as joining each item with one or two examples describing them (see Table 3).
- ² In Table 4 we can see that the variable *school* is not only not statistically significantly correlated with CBPS, but also with any other variable used in the study. This confirms that *there are no* significant socio-demographic, socio-economic, attitude or experiential differences between students of the two schools in which the study was conducted and that it is justified to treat them as one larger sample.
- ³ Since at the time of the research the co-author of this paper was employed as an expert associate in one of the mentioned schools, it was not necessary to obtain the approval of the Ministry of Science and Education to conduct the research.
- ⁴ Relying on the argument by Olweus (1998), that one of the basic features of bullying is the *repetition*, as well as two recent domestic studies (Vejmelka et al., 2017; Velki and Kuterovac Jagodić, 2016), a student was categorized as a cyberbully if he / she indicated on at least one item of CBPS that he / she perpetrated the described form of bullying *a few times, approximately once a week or several times a week*.
- ⁵ Although *owning a device with the Internet access* has shown as a good predictor of cyberbullying in theory and early research, considering the fact that 96,7 % of students in our sample have such a device, it is not surprising that this variable has the lowest correlation with cyberbullying perpetration and that it was not included in the regression model.
- ⁶ Since the *father's parenting style* and *mother's parenting style* should both be included in multiple regression analysis as predictors of cyberbullying perpetration, given their high intercorrelation ($r = 0,70$) we checked and found that there is a certain degree of collinearity between them. Therefore, we included only *father's parenting style* in the analysis (since it has a higher direct correlation with the criterion), so as not to suppress other potential predictors.
- ⁷ A statistically significant difference in the average score on the Cyberbullying Perpetration Scale between male and female students was also confirmed by the t-test ($p < 0,001$). Male students ($\bar{x} = 17,7$) are more prone to cyberbullying perpetration compared to female students ($\bar{x} = 14,5$).
- ⁸ A statistically significant difference in the average score on the Cyberbullying Perpetration Scale between 5th and 8th grade students was also confirmed by the t-test ($p < 0,001$). 8th grade students ($\bar{x} = 19,2$) are more prone to cyberbullying perpetration compared to 5th grade students ($\bar{x} = 12,9$).

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Prevalencija, oblici i prediktori elektroničkog nasilja

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SAŽETAK

Širenjem socijalnih interakcija iz fizičkog u „elektronički svijet“, među djecom i mladima pojavio se novi oblik nasilja koji se ostvaruje putem informacijsko-komunikacijskih tehnologija – elektroničko nasilje. S obzirom na to da je sigurnost djece na internetu jedna od glavnih preokupacija roditelja, odgojnih stručnjaka i medija u digitalnom dobu, u ovom smo radu istražili stopu prevalencije, pojavne oblike i prediktore koji potiču djecu na činjenje ove vrste nasilja. Istraživanje je provedeno metodom ankete na uzorku od 269 učenika 5. i 8. razreda dviju zagrebačkih osnovnih škola. Rezultati pokazuju da se u posljednja dva mjeseca 24,5 % učenika našlo u ulozi činitelja elektroničkog nasilja, da su njegovi najzastupljeniji oblici govorenje ružnih stvari, ruganje i ignoriranje drugih na društvenim mrežama, a njegovi najvažniji prediktori činjenje klasičnog nasilja, afirmativan stav o nasilju, doživljavanje elektroničkog nasilja, slabiji školski uspjeh te autoritaran odgojni stil roditelja. Autori zaključuju da ključ prevencije činjenja elektroničkog nasilja leži u suradnji nastavnika, stručnih suradnika, učenika, roditelja, ali i medija, te o njihovoj prilagodbi promjenjivome elektroničkom okruženju.

Ključne riječi: elektronički mediji, elektroničko nasilje, multipla regresijska analiza, prediktori, prevencija