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Differences in Cyberbullying Victimisation and Perpetration According to Age and Locality in Slovenia[1]

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Cyberbullying is a phenomenon that developed with the rise of everyday ICT use, especially by children and young people. Still, extant research on the subject in Slovenia is extremely limited, with only a few contributions or inclusions of questions in studies with a different focus. To deepen the existing knowledge, our aim was to examine the relationship between the age of respondents, the type of environment they come from, and their personal involvement in cyberbullying. We conducted analysis on data collected with an on-line questionnaire in 2018, with which we obtained responses from 2,991 primary and 2,296 secondary school students from various areas around Slovenia. We found that at least 55.3% of participants had been cyberbullied in that school year, and 10% had cyberbullied someone else in the previous two months. Both victimization and cyberbullying were significantly more common among older students from secondary school than those from primary school. Among primary schoolers, 15- and 16-year-olds were the most frequent victims (57% and 57.7% within age), and 15-year-olds were the most frequent bullies (10.4% within age). There were no significant differences according to age among secondary schoolers. In terms of location, we found statistically significant differences among primary school children, where the percentage of victims was the highest in suburban areas (58.3%). Cyberbullying perpetration and victimization in secondary schools were not significantly affected by the type of local environment.

Keywords: cyberbullying, children, youth, internet, cyberspace, age, urban, rural

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1 Introduction

Relationships among peers are affected by conflict situations from an early age. We learn social skills, coexistence with others, exercising our will, pursuing interests, adjustment, respect, and compliance with formal and informal social rules through direct interaction with others in primary and secondary socialization. Most conflict situations are minimized during adolescence and do not escalate into recurrent episodes of violence. However, there are cases where conflicts and abuse of power committed by children or young people become the norm and their peer victims can be put in this position for many years. In English this behaviour is described as bullying, though we run into various difficulties when translating this term into other languages (Smith et al., 2016). Additionally, authors use different definitions of bullying. Olweus's (1993: 9) definition as well as his preventive approach is one of the most used ones. He defines bullying as an event when a student is "exposed, repeatedly and over time, to negative actions on the part of one or more other students".

Despite different perspectives on bullying, the standard definition is that bullying is intentional behaviour, long-lasting,

[1] The empirical data used in this article is based on the project ClickOFF! (CyberVAW – Cyber Violence and Harassment against Women and Girls). The project leader is the Ministry of Labour, Family, Social Affairs and Equal Opportunities, with the University of Ljubljana, Faculty of Social Sciences, Ministry of the Interior – Police, and the Ministry of Justice – Centre for Judicial Training as partners. Project is co-financed by European Union within the Rights, Equality and Citizenship Programme (2014–2020).

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and damaging, committed by a child or a young person who victimises a peer (Dekleva, 2001; Espelage, 2018; Olweus & Limber, 2018; Smith, Barrio, & Tokunaga, 2012). Most authors add that perpetrators are disproportionately stronger than the victim, who has little to no ability to fight back (Olweus, 2009; Olweus & Limber, 2018).

The development of information and communication technology (ICT) and its daily use changed the characteristics of interpersonal relationships significantly, with young people being the most exposed age group. The Statistical Office of the Republic of Slovenia (2021a) reports that 97% of people aged 16-24 use the internet several times a day. They are in touch with technological improvements and are the biggest users of social networks, instant messaging, and smart devices. The increased influence of ICT did not only change communication, but at the same time transformed social interactions. Social distancing related to restrictions for prevention of the spread of COVID-19 led to additional increases in the use of various cyberspace solutions for learning, shopping, communicating, and spending free time.[6] However, the described transformation also had negative effects on various aspects of social life. A clear example is the transformation of bullying. In the past 15 years, it has been impossible to research bullying while neglecting its cyber component, i.e., cyberbullying.[7] This refers to bullying with the use of ICT, within which verbal and relational violence predominate. The power inequality does not derive from physical power, but rather from technological knowledge, the anonymity of perpetrators, and the nature of online communication, which itself places victims in a subordinate position (Smith et al., 2012). When cyberbullying is compared to traditional bullying, two elements, namely repetition and discontinuity, differ significantly. The nature of cyberspace does not require that the same act be repeated several times for continuous victimisation. One exposure of a hurtful image, video, or comment online can lead to its numerous repetitions by many users all over the world. In this situation, the victim is thus repeatedly victimised, hurt, and ashamed, every time the original violation is shared (Dooley, Pyzalski, & Cross, 2009; Gaffney, Farrington, Espelage, & Ttofi, 2019). Additionally, victims are usually extremely powerless since they cannot stop the spread of this abuse and cannot hide from it. Victimisations in cyberspace follow them in a parallel virtual reality even into their homes (Pušnik, 2012), which were previously considered a safe haven where traditional bullying ended.

Constant changes of trends in ICT use led to the development of ever-new forms of cyberbullying. One of the first categorization was based on the way of communicating or the media. This way, we distinguish (Kowalski, Limber, Agatston, 2008; Smith, Mahdavi, Carvalho, Fisher, Russell, & Tippett, 2008): cyberbullying via social networks, instant messaging, electronic mail, web pages, blogs, telephone calls, text messages, or in on-line multiplayer games. Based on the type of behaviour, the most recognizable forms of cyberbullying are flaming, denigration, impersonation or masquerading, outing and excluding, repeat messages and flooding, harassment, threats, trickery, and cyberstalking (Jaiswal, 2021; Vyawahare & Chatterjee, 2020), extortion, hate speech, posting photos without consent, sexual harassment online (Brečko, 2019).

In Slovenia, we are dealing with a lack of in-depth research data on bullying and cyberbullying. Apart from a couple of questions on peer violence included in other research, we do not have studies that would longitudinally monitor bullying and cyberbullying, analyse its manifestations, and explore the causes. The last (and only) empirical study of bullying with representative nationwide sample was conducted in 1995 (Pušnik, 1996), and ever since the situation has only been assessed through individual, partial (local or regional) studies on small non-representative samples or some questions are added to other studies. Šulc and Bučar Ručman (2019) conducted a meta-analysis that included nine empirical studies published in the period from 1991 to 2019. The results show that approximately 33% of children and adolescents have experienced bullying at least once, and 9.2% of them have experienced it repeatedly. This is similar to findings from international meta-analysis from 2014, finding the mean prevalence rate of bullying victimization to be 36% (Modecki, Minchin, Harbaugh, Guerra, & Runions, 2014). Even less attention is focused on cyberbullying, which has been extremely under-researched topic in Slovenia. Until the survey conducted as a part of the project "ClickOFF!" (Brečko & Bertok, 2020), which provides the empirical data for this paper, there were only two empirical studies focused on cyberbullying. However, they do not contribute significantly to a broader understanding of cyberbullying among children and adolescents in Slovenia. Filipčič's (2010) research (conference paper) included only a small sample (N = 41), whereas Završnik and Sedej (2012) focused on university students and not on primary and secondary school children

[6] In the time of increased use of internet during social distancing, formal lockdowns and nationwide closure of schools due to prevention of spread of the novel coronavirus, authors report increases in cyberbullying rates (Jain, Gupta, Satam, & Panda, 2020; Pichel, Foody, O'Higgins Norman, Feijóo, Varela, & Rial, 2021). UNICEF (2020) also addressed this issue.

[7] Most authors understand cyberbullying as a subset of bullying, with the same characteristics, only occurring within cyberspace (Kowalski et al., 2008; Olweus, 2017; Smith et al., 2008), while some believe it should be understood as a different phenomenon (Canty, Stubbet, Steers, & Collings, 2014).

and youth. Questions on cyberbullying have been included in some other research with different focus, though (Filipčič, Bertok, Karajić, Klemenčič, & Muršič, 2017; Jeriček Klanšček et al., 2019; Jontes, Luthar, & Oblak Črnič, 2015; Klemenčič, Mirazchiyski, & Novak, 2019; Kozmus & Pšunder, 2019; Lobe & Muha, 2010, 2011).

Through time, bullying and cyberbullying behaviour is being increasingly addressed. Social tolerance towards various forms of violence has decreased and we are now more aware of its consequences. The changes are reflected in various programs and activities aimed at recognizing and preventing bullying and cyberbullying. This form of violence was included in the Resolution on the National Programme for the prevention and suppression of crime for the period 2019–2023 (2019). The Slovenian Police also reports on the severity of the problems connected to bullying and cyberbullying in Slovenia, especially related to suicide attempts or even suicides.[8] Because of this problem, the Police, together with the Ministry of Education, Science and Sports, launched the project Preventing Bullying and Reducing Violence among Minors in Slovenia from 2018 to 2020, within the European Commission program. Unfortunately, it was based on presentations of good practices from abroad and did not include representative research of Slovene situation. Further, the Slovene Police placed "bullying and violence among minors (both online and offline)" as the priority of the Slovene presidency of the European Crime Prevention Network in 2021 (EUCP, 2021).

Knowledge and understanding of specific unwanted social phenomena, such as cyberbullying, is of key importance if we want to successfully address and prevent it. The World Health Organization (WHO, 2015) emphasises the importance of collecting data on the magnitude and patterns of youth violence, and further on the use of this data in designing and implementing counter-measures. According to these conclusions, we aim to provide a needed contribution to the incomplete data on the cyberbullying situation in Slovenia. This paper focuses on two important aspects of cyberbullying: 1) the correlations of age with involvement in cyberbullying; 2) the correlations between cyberbullying and types of local settlement (urban/suburban/rural) children come from.

2 Differences in Cyberbullying According to Age

Results of the studies that focused on the influence of age on cyberbullying remain inconclusive. Despite the logical presumption that age influences cyberbullying involvement, because older children have more access to electronic devices (Slonje & Smith, 2008), some early studies did not report on significant age differences (Beran & Li, 2008; Campbell, Spears, Slee, Butler, & Kift, 2012; Kapatzia & Sygkollitou, 2008; Li, 2008; Smith et al., 2008). However, there are also confronting results. Some studies among children and young people in the age group 10-20 years report on significant differences regarding the age. They conclude that young people are most exposed to cyberbullying in the age gap 14-15 years (Ortega, Elipe, Mora-Merch, Calmaestra, & Vega, 2009; Slonje, Smith, & Frisen, 2012), which is a bit later than for traditional bullying (Kowalski, Giumetti, Schroeder, & Lattanner, 2014). Around 14-year-old students are more often targets than those younger (Hinduja & Patchin, 2008; Kowalski & Limber, 2007) or older than them are (Aoyama, Barnard-Brak, & Talbert, 2011; Shapka, Onditi, Collie, & Lapidot-Lefler, 2017). Studies in Japan conclude the highest exposure to cyberbullying among children in the age range of 11 to 13 years (Aoyama & Talbert, 2009); in Sweden, the peak is reached at the age 12 to 15 and afterwards this exposure starts to decrease (Slonje & Smith, 2008). As for cyberbullies, most authors conclude that young people over 15 and 16 years are the most frequent perpetrators (Aoyama et al., 2011; Jaghoory, Bjorkqvist, & Osterman, 2015; Slonje, Smith, & Frisen, 2013; Walrave & Heirman, 2011). Pichel et al. (2021) similarly report on the statistically significant correlations. The share of cyberbullying perpetrators increases with age, with the peak at 16-17 years (6.7% of respondents), whereas the share of cyberbullying victims initially rises from 3.7% at the age of 10-11 to 12.5% at the age of 14-15, and afterwards decreases.

Pichel et al. (2021) also found differences in types of cyberbullying through different age periods. The most common type of cyberbullying behaviour in all age groups included direct insults (name-calling) through text or online messages and spreading of rumours online. Differences are most obvious with creating fake accounts and pretending to be someone else (victim), posting embarrassing videos and pictures of victims online, and altering posted pictures and videos, which were most common for the older (16-17 years) respondents.

On the other hand, some studies conclude that cyberbullying is more frequent in primary and middle schools than in secondary schools (e.g., Dehue, Bolman, & Völlink, 2008). It is important to add that the increasing use of ICT by noticeably young children exposes them to cyberbullying, too

[8] Bullying is not the only cause of suicide, though in some cases it comprises an important element of it (Holt et al., 2015). The Statistical Office of Republic of Slovenia (2021b) reports on between 28 and 50 suicides of adolescents and children per year in Slovenia between 2010 and 2019.

(Smith, 2019). Monks, Robinson and Worlidge (2012) found that 20.5% of children aged from 7 to 11 years have reported being cyberbullied and 5% of them acting as cyberbullies themselves.

In Slovenia, Lobe and Muha (2010) perceived some differences on an otherwise very small proportion of questioned children who had already experienced online or mobile bullying as victims (only 4% of interviewed ware bullied online and 3% via mobile phone). They found that there was a smaller percentage of victimised children in age group between 9- and 12-year-olds (2% victimised through internet and mobile phone) than from 15 to 16 years (8% through internet and 6% through mobile phone). In their next study (Lobe & Muha, 2011), the youngest (11–14 years, 17%) again reported the least victimization, followed by the oldest age group (18–19 years, 37%), and the most was reported by children aged 15 to 17 (40%). Given the type of cyberbullying, older children rated bullying via instant messaging as the most common, while the youngest (11–14 years) experienced bullying via social networks more often. In the national survey GBSC Health behaviour in school-aged children in Slovenia (Jeriček Klanšček et al., 2019), in 2018, for the first time, one question about the perpetration and victimization of cyberbullying was included. No age differences were detected (between 11- and 13-year-old children). None of those basic percentage comparisons were confirmed by appropriate statistical tests in any of the analyses on Slovenian samples.

3 Differences in Cyberbullying among Rural and Urban Communities

Discussions on the differences between urban and rural environments in the involvement of children and adolescents in traditional forms of bullying address a variety of aspects that are, however, rarely adequately empirically supported. Assuming that rural environments are often neglected in terms of socio-economic conditions and addressing the problem of bullying, some researchers focus on identifying the extent of the phenomenon only in rural schools (Kowalski, Giumetti, & Limber, 2017). In these, the proportion of victims of bullying is estimated to be between 11 and 84% (Stockdale, Hangaduambo, Duys, Larson, & Sarvela, 2002; Dulmus, Theriot, Sowers, & Blackburn, 2004). However, due to the diverse methodology their results are often not comparable. Some researchers comparing different environments at the same time found that, compared to urban environments, children from rural areas are more often perpetrators (Nansel, Overpeck, Pilla, Ruan, Simons-Morton, & Scheidt, 2001) and/or victims of bullying (Leadbeater, Sukhawathanakul, Smith, Yeung Thompson, Gladstone, & Sklar, 2013; Robers, Kemp, & Truman, 2013), and that the problem of bullying is more frequent in smaller schools than in larger ones (Ma, 2001). On the other hand, some authors find the opposite, that teachers in larger schools perceive more victims of bullying (Klein & Cornell, 2010). More often than not, a comparison of self-perceived involvement in bullying by environment does not confirm differences between urban and rural (Jayousi, 2020; Laeheem, Kuning, McNeil, & Besag, 2009; Vaughn et al., 2010; Waasdorp, Pas, O'Brennan, & Bradshaw, 2010) or between different-sized schools (Klein & Cornell, 2010; Whitney & Smith, 1993).

Differences between types of communities are even less addressed in cyberbullying. The incidence alone is poorly researched in rural areas. Exceptions indicate a relatively low involvement of children from rural areas in cyberbullying (Bauman, 2010; Ncube & Dube, 2016; Price, Chin, Higa-McMillan, Kim, & Frueh, 2013), which could be due to poorer accessibility or less frequent use of ICT devices by children compared to cities (Kowalski et al., 2017). Dujmic et al. (2019) confirmed this difference in ICT use on the Croatian sample. Some of the studies conducting statistical comparison also confirmed that children from urban areas are more likely to be involved in cyberbullying (Chang et al., 2016; Dujmic et al., 2019; Maftei & Grigore, 2020; Park, Na, & Kim, 2014). On the contrary, Le (2020) found a higher proportion of children who have already been victims of cyberbullying in rural, and Gorzig, Milosevic and Staksrud (2017) in less densely populated areas. Children there might be more exposed to victimization due to poorer information literacy and parental supervision, which also makes children less prepared to respond to online threats (Dujmic et al., 2019; Le, 2020; Park, Golden, Vizcaino-Vickers, Jidong, & Raj, 2021). On the other hand, Robers et al. (2013) do perceive differences between urban and suburban areas, with higher involvement in the latter, but not with rural ones. Some other authors also note that there are no significant differences in the proportion of those involved in cyberbullying between areas (Morin, Bradshaw, & Kush, 2018; Ronis & Slaunwhite, 2017; Saleem, Khan, & Zafar, 2021).

4 Research Methods

In our study, we addressed the following general research questions: What is the overall situation regarding cyberbullying in Slovenia and how often are children and young people exposed to and involved in this phenomenon? According to our literature review, we more specifically hypothesize that cyberbullying victimisation and perpetration differ through age ranges, expecting that younger children are more frequently victims of cyberbullying, whereas older children more often take the role of cyberbullies. Further, we hypothesize that

there is no difference in cyberbullying according to the children's place of residence (i.e., living in urban/suburban/rural communities).

We analyse the data gathered in survey as a part of "ClickOFF!" project.[9] Target population included in the study was Slovenian primary school students from 7th, 8th and 9th grades and secondary school students of all grades (the majority aged from 13 to 19 years). A stratified random sampling approach (considering statistical regions and the size of the area where school is located) was used, with 100 primary and 50 secondary schoolers invited to participate in the study. 62 primary and 17 secondary schools responded, and, in each school, one class of each year was randomly selected. Collection of data took place between 8 March 2018 and 8 June 2018. Students answered the questionnaire in schools, with anonymity guaranteed. Most of the analysed categories for cyberbullying involvement were nominal, so we tested our hypotheses with Chi-square tests. Additionally, some correlations were tested with Spearman's rank coefficient or t-test. The statistical significance level for all tests was 0.05. Altogether, 5,287 students started answering the questionnaire, and 195 of them discontinued at one point. Still, we included those in analysis to consider at least the answers they did provide. This way, we conducted analysis on 2,991 primary school and 2,296 secondary school students, aged from 13 to 22[10] years.[11]

5 Results

5.1 ICT Use

As seen in Table 1, the vast majority of respondents use some kind of ICT device regularly. Smartphones with internet access were the most frequently used (91% every day and 98.4% at least 'less than once a month'), followed by personal computers or laptops (97.9% at least 'less than once a month'), and mobile phones without internet access (60.5% at least 'less than once a month'). Only 15 children (0.3%) reported never using any of devices listed at all.

Table 1: ICT use by devices (valid %)

How often do you use the following devices (consider the use at home and elsewhere):						
	every day	**at least once a week**	**less than once a week**	**at least once a month**	**less than once a month**	**I don't use them at all**
PC or laptop	41.3	37.2	9.5	5.7	4.2	2.1
Smartphone	91	5.2	1.2	0,5	0.4	1.6
Mobile phone	30.4	13.3	6.4	4.7	5.8	39.5
Tablet	11	12.3	9.4	8	10.1	49.2

Spearman's rank correlation calculations showed weak correlation between the age of respondents and use of ICT devices. Correlations were negative for computer ($r = -0.262$, $p = 0.000$), smartphone ($p = -0.183$, $p = 0.000$), and mobile phone ($r = -0.121$, $p = 0.000$) use, and positive for tablet ($r = 0.084$, $p = 0.000$). Given that the devices use scale orientation, this means that computers, smartphones and mobile phones are more used by older, while tablet use is more frequent with younger children.

5.2 Cyberbullying Involvement

For cyberbullying victimization, a yes/no question with 14 variables (forms of cyberbullying)[12] was asked: "Here are some forms of cyberbullying. Please indicate if any of the following happened to you this school year" (e.g., in the last 6 to 9 months). The most common type of behaviour was spreading untrue ru-

[9] Data is available online at the Social Science Data Archives (orig. Arhiv družboslovnih podatkov) and unrestricted use for academic purposes only is available upon request (arhiv.podatkov@fdv.uni-lj.si).

[10] We included students who answered they are above 19 years old, i.e., 20 (n = 92), 21 (n = 29), and 22 (n = 5), since there is an actual possibility that this information is true. Some of them might have matriculated to school a year later, and some of them might have failed certain grade and repeated it.

[11] We calculated their age based on the year of birth they provided, considering the year of data collection (2018) and assuming they had already had birthday that year. Some of the respondents (n = 106) did not provide their year of birth or answered with an unreliable answer (below 13 or above 22 years old after calculation), so we did not include them in age-related analyses.

[12] I.e., threats, inappropriate messages, rumors, sharing private photos, fake profile, website creation, altering pictures, blackmailing, offensive comments, sharing secret, scary messages, identity theft, unwanted photos or videos, et alia.

mours about a person online (36% of those who answered the question stated that it had happened to them), followed by receiving messages with inappropriate content (29.4%). Fewer respondents confirmed they had received photos or videos they did not want to see (22%), offensive and rude comments about their appearance (20%), threats (15.9%), or a message that scared them (13.7%), or that someone had shared their photos or videos that were not intended for the public (12.2%). Other forms of cyberbullying were rarely reported (bellow 10%).[13]

As a victim of cyberbullying, we considered the respondent who answered with "yes" on at least one of the categories. Table 2 shows that at least 55.3% of participants had been cyberbullied in that school year, while 17.2% of them have not been for sure. Other 27.5% did not answer all the questions, so we cannot conclude with certainty if they have been victims or not.[14]

Table 2: Cyberbullying victimization "in this school year"

Cyber-victimization	f	valid %
YES (victim for at least one of the categories of CB)	2,925	55.3
At least one answer left blank	1,455	27.5
NO (not victim for any of the categories of CB)	907	17.2

On a 6-point scale question about cyberbullying behaviour, most of the respondents (90% of those who answered the question) said they had not cyberbullied anyone in the previous two months (table 3), followed by those who had done so only once or twice (4.9%). Among recurring offenders, there were more of them who indicated that they cyberbullied others every day (2.2%) than those who were doing it less often.

To identify a bully-victim category, we merged all the positive answers from perpetration question in one category and checked the overlap with victimisation variable with cross tabulation. There were 351 respondents identified as bully-victim, which is 7.9% of valid cases for both variables.

5.3 Age and Cyberbullying

The mean age for all respondents who answered with reliable age information was 15.6 years, with a minimum of 13 and maximum of 22 years. Those who were identified as victims were on average 15.68 years old, while those identified as bullies were 15.89. T-tests for independent samples showed there are significant differences in average age among victims and non-victims ($p = 0.000$), with victims being older, as well as among bullies and non-bullies ($p = 0.001$), with bullies being older as well.

Table 3: Cyberbullying perpetration „in the previous two months"

Have you cyberbullied anyone via your mobile phone or internet in the last two months?		
	f	valid %
I have not cyberbullied anyone in the past two months.	3,989	90
It only happened once or twice.	218	4.9
It happened three to five times.	52	1.2
It happened approximately once a week.	47	1.1
It happened several times a week.	29	0.7
It happened every day.	98	2.2

Table 4 shows differences in cyberbullying involvement between different ages of students, with 19-year-olds and older grouped together,[15] using chi-square test and contingency table

[13] The order of the types of cyberbullying by frequency is identical in primary and secondary school, as well as in urban, suburban, and rural environments if analysed individually.

[14] For further analyses, we formed two cyber-victim categories, namely "yes" for those who indicated that they had been cyberbullied, and "no" for others who either indicated that they had not been or did not provide all the answers.

[15] By grouping 19-year-olds and older we formed a group big enough to be comparable with other ages, while we also joined those students who are older than usual for 4th year of secondary school (18 years).

for comparison of percentages. Differences were statistically significant for both, victims (χ^2 = 27.24, p = 0.000) and bullies (χ^2 = 17.90, p = 0.006). Values in table 4 present cyber victimization and perpetration rates among certain age group. 18-year-olds had the highest rate of cyber victimization (with 60% of 18-year-olds being victimized in that school year), followed by 17-, 16-, and 19-year-olds or older. For cyber bullies, the highest rate was among 17-year-olds (12.9%), 18- (11.4%) and 19-year-olds or older (10.8%), with lower rates among younger children.

Table 4: Chi-square test and percentages for age and cyberbullying involvement

	age (years)								
	13	**14**	**15**	**16**	**17**	**18**	**19+**	χ^2	**p**
victims (within age)	49.8%	52%	57 %	58.2%	58.5%	60%	57.3%	27.24	0.000
bullies (within age)	6.7%	8.3%	10.4 %	9.4%	12.9%	11.4%	10.8%	17.90	0.006

With the original question on cyberbullying perpetration, measured on 5-point frequency scale, we were able to calculate the Spearman's correlation for age as well. Correlation was statistically significant (p = 0.000), with positive but weak coefficient (r = 0.057).

Based on calculations of rates within certain age, the following categories of cyberbullying victimisation were mostly reported by 18-year-olds: 'I was threatened', 'I received messages with inappropriate content', 'they spread untrue rumours about me', 'a fake profile of me was created (e.g., on Facebook)', 'a website about me was created', and 'I received photos or videos I didn't want to see'. 16-year-olds mostly reported about: 'they shared my photos or videos that were not intended for the public', 'a fake profile of me was created (e.g., on Facebook)', 'someone shared a secret online that I confided to only one person', and 'I received a message that scared me'. 'I have received offensive, rude comments about my appearance' was mostly reported by 15-year-olds and 'my pictures have been altered in an insulting way' by 19-year-olds or older. Differences in age were not statistically significant for the statements: 'they blackmailed me' and 'someone pretended to be me and have been sending messages around, and I lost my friends and reputation'.

5.4 Age by School Level

We also found significant differences between primary and secondary school students. There were more cyber victims (χ^2 = 16.49, p = 0.000) and bullies (χ^2 = 9.28, p = 0.002) among secondary school students, with 58.5% of them reporting victimization (versus 52.9% of primary schoolers), and 11.6% of them having acted as bullies (versus 8.8% of primary schoolers). Based on this finding, we additionally conducted Chi-square tests for age separately for each school level.

For primary school (table 5), we found significant differences for victimization among different ages (χ^2 = 10.66, p = 0.014), with older children being more frequently victimized than younger. For standard statistical significance level of 0.05, differences within age for bullies were not significant, but would be for weaker significance level of 0.1 (χ^2 = 7.07, p = 0.07). There were slightly more bullies among 15-year-olds than younger (and older).

Table 5: Chi-square test and percentages for age and cyberbullying involvement for primary school

	age (years; primary school)					
	13	**14**	**15**	**16**	χ^2	**p**
victims (within age)	49.8%	52%	57%	57.7%	10.66	0.014
bullies (within age)	6.7%	8.3%	10.4%	6.7%	7.07	0.070

No significant differences were found in cyberbullying victimisation (χ^2 = 0.59, p = 0.9), nor for perpetration (χ^2 = 2.69, p = 0.442) among different aged children in secondary school (table 6).

Table 6: Chi-square test and percentages for age and cyberbullying involvement for secondary school

	age (years; secondary school)					
	16	**17**	**18**	**19+**	χ^2	**p**
victims (within age)	58.2%	58.6%	59.8%	57.6%	0.59	0.900
bullies (within age)	9.7%	13%	11.2%	10.8%	2.69	0.442

5.5 Urban-Rural Divide by School Level

Based on identified correlations for locality and school level[16], we rather conducted Chi-square tests for area of residence separately by school level. This way we made sure that the perceived differences among environments were not due to differences in school level or age (see the chapter on Age by school level).

In primary school (Table 7), differences were significant for cyber victimization ($\chi^2 = 13.39$, $p = 0.001$) – children from suburban areas had the highest rate of victimisation, with 58.3% of them reported being cyberbullied. Next, 55.4% of children from urban environments were victims, and 50.9% from rural. There were no major differences among different residential areas for cyber bullies ($\chi^2 = 0.91$, $p = 0.634$).

In secondary schools (table 8), differences between residential areas were not significant neither for cyberbullying victimisation ($\chi^2 = 3.88$, $p = 0.144$), nor for perpetration ($\chi^2 = 3.53$, $p = 0.172$,).

5.6 Use of ICT Devices, Age, and Cyberbullying

According to logistic regression with cyberbullying victimisation as dependent, and age and use of ICT devices as independent variables,[17] we additionally found that age and use of smartphones have a significant effect on victimisation. The victimisation is higher with older students ($B = 0.05$, $p = 0.000$), and with those who use smartphones more regularly ($B = -.15$, $p = 0.000$), with all the other included variables constant. Use of other devices does not affect the victimization significantly.

Table 7: Chi-square tests and percentages for locality and cyberbullying involvement for primary school

How would you describe the area where you live? (**primary** school)					
	big city	**town**	**village**	χ^2	**p**
victims (within area)	55.4%	58.3%	50.9%	13.39	0.001
bullies (within area)	10.2%	8.3%	8.2%	0.91	0.634

Table 8: Chi-square tests and percentages for locality and cyberbullying involvement for secondary school

How would you describe the area where you live? (**secondary** school)					
	big city	**town**	**village**	χ^2	**p**
victims (within area)	54.1%	60%	59.3%	3.88	0.144
bullies (within area)	12%	12.2%	9.5%	3.53	0.172

[16] In our sample, there were more students from primary school living in rural and more students from secondary school living in urban environments ($\chi^2 = 154.18$, $p = 0.000$).

[17] The model was significant ($p = 0.000$), but a very low percentage of the variance in victimization was explained with independent variables (from 0.7 to 0.9%).

6 Concluding Discussion

Most of the children in our sample use at least one type of electronic device every day or at least once a week, which might strongly expose them to risks of cyberbullying. Without comprehensive approaches to addressing and preventing bullying behaviour among children online, it is no surprise that more than half of children have already been victims of at least one form of cyberbullying. It is possible that this rate is even higher, since nearly a third of respondents did not answer all of the questions about victimisation. Given the fact that this was a sensitive question and that significant share of children do not want to reveal their victimisation, it is possible that at least some of those missing answers would be positive if answered truthfully. On the other hand, the percentage of those who have confessed to having bullied others is significantly lower – 10%. Previous studies do report on lower rates of bullies compared to victims, but the difference is mostly insignificant (e.g., Pichel et al., 2021; Shapka et al., 2017).

Testing our first hypothesis, we did find significant differences in cyberbullying victimisation and perpetration regarding age, but not completely as expected. We hypothesised younger children to be victims more often, but, on the contrary, they were older. The t-test confirmed that victims are on average older than non-victims are, and the Chi-square showed that 18-, 17-, and 16-year-olds are victims the most frequently. This might be due to differences among primary and secondary schoolers, with the latter being victims more often, with no significant differences in their age. This was in contrast to most extant foreign research, either finding no age differences (e.g., Campbell et al., 2012; Smith et al., 2008), or finding 14-year-olds (e.g., Aoyama et al., 2011; Shapka et al., 2017) or even younger (Aoyama & Talbert, 2009) to be the most common victims. In primary schools alone, we found 15-year-old children the most frequent victims. For bullies, the results were similar – they were, as expected, on average older than non-bullies were, and 17, 18 and 19 or older were bullies more frequently. This was also due to differences between primary and secondary school, since there were no differences among different-aged primary (conditionally, with 0.1 significance level, there were more bullies among 15-year-olds) and different-aged secondary schoolers. Most extant research indeed confirms older students to be bullies more often, but at a year or so younger than in our sample, e.g., 16 and 17 (Pichel et al., 2021) or over 15 and 16 (Jaghoory et al., 2015).

The second hypothesis was also partially confirmed, namely that, separately by school level, there were in general no significant differences in cyberbullying involvement according to children's area of residence. The exception was victimization in primary school, which was higher in suburban areas (similar as in Robers et al., 2013). Except for this, our findings for bullying perpetration and victimisation in secondary schools are relatively consistent with studies finding no differences among different areas (Morin et al., 2018; Saleem et al., 2021).

We have never conducted a study in Slovenia that would cover the broader socio-political dimensions of the intertwining of violence and school space. Consequently, all measures to prevent and confront violence in schools that take place in Slovenian schools follow common-sense approaches and are not the result of a serious and comprehensive scientific analysis of the problem. The research itself is made difficult by the fact that being a victim is a sensitive topic about which children rarely speak to adults. Additionally, the perpetrators might be unknown and difficult to identify due to their anonymity on the internet. Most of the cases therefore go undiscovered, and even more of them unreported to authorities, so there is no data about the actual number of cyberbullying cases among children in Slovenia. In fact, there is no adequate anti-bullying legislation in Slovenia and only the most extreme cases constituting criminal offenses are under the authority of the police. Therefore schools are expected to play the most active role in ensuring a safe environment for children and prevent or appropriately respond to the cases of bullying among their students.

In the future, there should be more effort to address cyberbullying in schools in urban, suburban as well as rural communities. It is important to note that in primary school, cyberbullying is the most frequent in the last year. After that, it even increases in secondary school. It seems like there is particularly strong effect of the school level, not of the age, for cyberbullying involvement. It might be possible that this is due to the growing prevalence of ICT use at the end of primary school, which is later more consistent for secondary schoolers. Consequentially, the effect of age is no longer significant in secondary schools.

The first limitation to our study might be the question of the honesty of answers. Cyberbullying is a sensitive topic, and we expect some socially desirable or unreliable answers. Regarding children's area of residence, it is possible that especially younger children do not know very well how to assess the type of their environment (i.e., urban, suburban, or rural), so there might be some misinterpretation. Additionally, we were unable to analyse an important group of bully-victims, due to different time frames of questions about victimisation ("in this school year") and bullying behaviour ("in the previous two months"). More research is clearly needed on the reasons and types of cyberbullying across ages and residential areas to expand understanding of the phenomena and to develop comprehensive prevention programs.

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Razlike pri vpletenosti v kibernetsko nadlegovanje otrok in mladostnikov glede na starost in vrsto lokalnega okolja

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Kibernetsko nadlegovanje je svoje razsežnosti pridobilo z občutnim porastom vsakodnevne uporabe informacijsko-komunikacijske tehnologije predvsem pri otrocih in mladostnikih. Kljub temu je raziskovanje na to temo v Sloveniji do danes izjemno omejeno in zajema le nekaj prispevkov ali vključitev posameznih vprašanj v raziskave z drugačnim fokusom. Da bi poglobili obstoječe znanje, je bil naš cilj v prispevku preučiti odnos med starostjo anketirancev, vrsto okolja, iz katerega prihajajo, in njihovo vpletenostjo v kibernetsko nadlegovanje. Opravili smo analizo podatkov, pridobljenih leta 2018 prek spletnega vprašalnika, pri čemer je sodelovalo 2.991 osnovnošolcev in 2.296 srednješolcev iz različnih lokalnih okolij v Sloveniji. Ugotovili smo, da je bilo v tistem šolskem letu prek IKT nadlegovanih vsaj 55,3 % anketirancev, medtem ko jih je 10 % nadlegovalo nekoga drugega v zadnjih dveh mesecih. Tako viktimizacija kot storilstvo sta bila značilno pogostejša pri starejših otrocih v srednji šoli kot pri tistih iz osnovne šole. Pri slednjih so bili žrtve najpogosteje 15- in 16-letniki (57 % in 57,7 % znotraj te starosti), 15-letniki pa so bili tudi najpogosteje storilci (10,4 % znotraj starosti). Med srednješolci ni bilo statistično značilnih razlik glede na njihovo starost. Glede vrste okolja smo identificirali statistično značilne razlike med osnovnošolci, pri katerih je bil delež žrtev največji na primestnih območjih (58,3 %). Na viktimizacijo v srednjih šolah in na storilstvo na obeh ravneh šolanja vrsta lokalnega okolja ni vplivala.

Ključne besede: kibernetsko nadlegovanje, otroci, mladostniki, internet, kibernetski prostor, starost, mestno okolje, podeželsko okolje

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