Research

The Relationship Between Middle School Students' Digital Literacy Levels, Social Medıa Usage Purposes and Cyberbullying Threat Level

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Abstract:

The study aims to reveal the relationship between middle school students' digital literacy levels, social media usage purposes, and the frequency of experiencing cyberbullying. A relational model was used in the research. The sample of the study consists of 476 middle school students between the ages of 10-13. "Digital Literacy Scale," "Social Media Usage Purposes Scale," and "Cyberbullying Threat Level Scale" were used to obtain the data. t-test (Mann Whitney U), ANOVA (Kruskal Wallis), and correlation analysis were used in the study. The findings showed that students' digital literacy and the use of social media for interpersonal interaction and lesson preparation were moderate and their witnessing, exhibiting, and exposure to cyberbullying was very low. Finally, there were moderate positive relationships between middle school students' digital literacy levels and social media usage for interpersonal interaction and lesson preparation purposes. In addition, digital literacy had a weak positive relationship with being exposed to and witnessing cyberbullying.

Citation:
Seçkin-Kapucu, M., Özcan, H. & Karakaya-Özyer, K. (2021). The relationship between middle school students' digital literacy levels, social media usage purposes and cyberbullying threat level. *International Journal of Modern Education Studies, 5*(2), 437-566. http://dx.doi.org/10.51383/ijonmes.2021.136

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INTRODUCTION

Various global events such as war, economic crisis, and pandemics have added different dimensions to education. The school closures due to the Covid 19 pandemic have expanded the boundaries of education worldwide by pushing the students to mandatory online learning. As traditional teaching methods were not be used, the administrations of schools and universities chose online courses as an alternative for continuing education (Adnan & Anwar, 2020). This online learning environment had both positive and negative effects on students. Spending time on the internet inevitably enabled students to gain many skills in the electronic environment, i.e., using search engines to access information, sharing files and content over internet sites, using social networks, and solving technical problems (Bilge & Kılcan, 2020). In addition to these gains, students' participation in online activities and their free use of social media might have led to dangerous situations, including cyberbullying (Purnama et al., 2021). Negative experiences raised the question of how aware students were of their digital resilience (Tran et al., 2020).

Glister first used the concept of digital literacy in the late 1990s (Meyers, Erickson & Small, 2013). Digital literacy includes a set of skills for accessing the internet and finding, managing, and organizing digital information; it is "the ability to use and evaluate digital resources, tools and services appropriately and apply this to lifelong learning processes" (Glister, 1997, p. 220). Although different definitions of digital literacy have been developed, it is defined in the simplest sense as "The ability to survive in the digital age" (Eshet, 2004, p. 102). Based on these definitions, "digital literacy" can be expressed as learning essential digital skills to keep up with the digital world. Crucial digital skills include the skills that enable the use of digital tools such as turning the machine on, off, keyboard use, mouse use, touchpad use, right-left click, double click, long press, creating, saving, finding, and editing computer files, and opening, using, and closing various computer applications. Basic digital skills also include having the language and literacy skills necessary to perform tasks in daily life, such as a child emailing the teacher through digital media or an individual completing a job application online (LINCS, 2021). Digital literacy is seen as an extension contributing to traditional literacy, and it is required to work, learn and socialize in the contemporary world (Churchill, Ping, Oakley & Churchill, 2008). The studies on basic digital skills involve digital literacy, information security awareness (Dönmez, 2019; Talan & Aktürk, 2021),

lifelong learning (Özoğlu & Kaya, 2020), digital citizenship (Kaya, 2020), sensitivity to cyberbullying (Kozan & Özbek, 2019), internet addiction (Kul, 2020), leisure attitudes and socialization tactics (Gürtekin, 2019), and information seeking and interpretation strategies in the web environment (Kara, 2021). There were few studies conducted for middle school students. One of them examined digital literacy levels of middle school 5th-grade students according to demographic variables (Pala & Başıbüyük, 2020a). In another study conducted by Pala and Başıbüyük (2021), middle school students' academic success was predicted using their digital literacy levels, self-control, and course motivation.

According to the "Household Information Technologies Usage Survey Report," published by the Turkish Statistical Institute (TSI, 2020), the rate of internet access from home was 88.3% in 2019, while it was 90.7% in 2020. As the internet access rate increases, the use of social media as a communication medium increases, and students face many positive and negative cases (Hançer & Mişe, 2019). This situation also affects students' social media perceptions. Studies have shown that students' attitude towards social media is partially positive (Alican & Saban, 2013). Some students perceived social media as an informative and enlightening medium that provides communication. In contrast, another part of them saw it as a dangerous, harmful and futile occupation (Üztemur & Dinç, 2020). The review of middle school students' social network usage purposes showed that they mostly use social network to communicate with their friends (Eren, 2014; Tuğlu, 2017). Similarly, middle school 7th- and 8th-grade students primarily use the internet to join social networks (Baştürk-Akca et al., 2015). In addition, they found that the internet was an important interaction medium; it had positive aspects in terms of easily accessing information, but there were also negative aspects such as exposure to cyberbullying. With the widespread use of internet access, social media platforms had become a medium where cyberbullying was experienced rather than a place where adolescents have fun among themselves (Baştürk-Akca et al., 2015).

Cyberbullying, which draws more and more attention from educational politicians, is defined as deliberate and repeated harmful behaviours via electronic text (Patchin & Hinduja, 2006). In other words, it includes bullying through technology (Kowalski & Morgan, 2017). Increasing access to new technologies in education can improve students' social interaction and collaborative learning experiences, and it also brings severe

cyberbullying problems in schools with the introduction of electronic communication into classrooms (Erdur-Baker & Kavşut, 2007; Li, 2006, Patchin & Hinduja, 2006; Salı et al., 2015). Cyberbullying, which can be seen in various forms, may occur on websites, blogs, social networking sites such as Facebook, Twitter, Instagram), and messaging programs on smartphones and may negatively affect people's social lives (Gencer, 2017). In a study conducted with 7th-grade students in Canada, approximately 54% of students were victims of traditional bullying, and more than a quarter of them were cyberbullied (Li, 2006). The first cyberbullying research conducted in Turkey examined the cyberbullying and victimization status of 14-19-year-old students (Erdur-Baker & Kavşut, 2007). This study showed that cyberbullying and cyber victimization were experienced in Turkey as in other countries. At the same time, male students do more cyberbullying and were more exposed to cyberbullying than female students.

In the 2010s, the relationship between cyberbullying and many variables such as parental control, digital citizenship, aggression level, internet addiction, gender, and class level was investigated (Akbaba & Eroğlu, 2013; Gencer, 2017, Öztürk, 2019; Peker, 2015; Salı et al., 2015; Yelci, 2018). The study conducted by Öztürk (2019) revealed a significant, positive, and low-level relationship between 8th-grade students' digital citizenship levels and their disposition towards cyberbullying. It concluded that cyberbullying tendencies of the students who spend more time on the internet were high. Özkan (2019) examined the cyberbullying behaviours and cyber victimization of middle school students studying in Konya. He found that cyberbullying and cyber victimization increase as the grade level increases, and male students were more bullies and victims than female students.

Digital literacy studies in the education literature focused mainly on teacher candidates. The only two studies that tried to determine the digital literacy levels of middle school students targeted 5th- grade students. No study covered students of all middle school grades or reveals the differences between age groups. Additionally, there were few studies on the frequency of cyberbullying among middle school students (Özkan, 2019; Yelci, 2018; Gencer, 2017; Salı et al., 2015). There were also no studies that focused on the relationship between digital literacy levels, social media usage purposes, and the frequency of cyberbullying.

Most students displaced due to Covid 19 school closures participated in the online learning process. Due to the fact that children actively use social media platforms in today's technology, the research problem was set as determining the importance of the students' digital literacy in the online learning process. Figure 1 summarizes the research objectives.
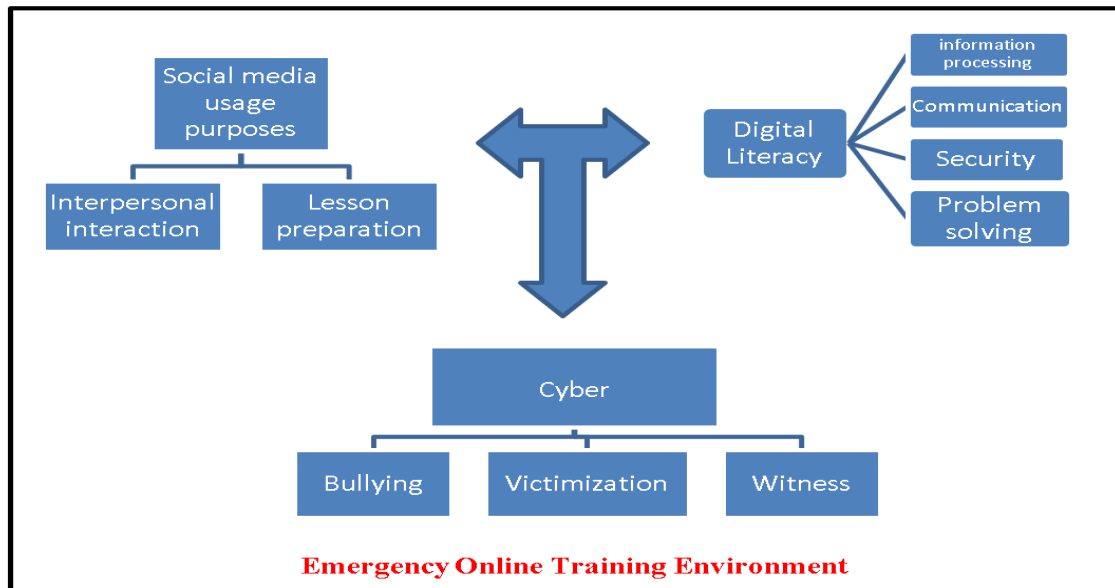

Figure 1. Objectives of the Research Purpose of the Study

Therefore, the purpose of the study is to reveal the relationship between middle school students' digital literacy levels, social media usage purposes, and the frequency of experiencing cyberbullying. Another objective of the study is to determine gender and age effect on these variables.

For this purpose, the following questions were addressed.

1. What are the digital literacy competencies of middle school students? Do middle school students' digital literacy levels differ significantly according to gender and age?

2. What are the social media usage purposes of middle school students? Do middle school students' social media usage purposes differ significantly according to gender and age?

3. What is the level of *witnessing, exhibiting, and exposure to cyberbullying* of middle school students? Does middle school students' cyberbullying threat level differ significantly according to gender and age?

4. Is there a significant relationship between middle school students' digital literacy levels, social media usage purposes, and cyberbullying threat level?

METHOD

Research Model

The identification and analysis of human behaviour in individual and social relationships is a complex process thus, the relational scanning model was chosen in this study because the aim is to determine the relations at a basic level and to make them understandable (Büyüköztürk et al., 2020).

Sample

The population of this research was set as 1030 students studying in a state middle school in the Mediterranean Region in Turkey in the 2020-2021 academic year. The convenience sampling method was preferred in selecting the study group considering the researcher's easy access to collect the data. Data were collected from 511 students who volunteered to participate in the study. The data of 35 participants was eliminated due to insufficient or missing information. The analysis was carried out with 476 participants. Demographic information of the participants is summarized in Table 1.

Table 1

Demographic Information of the Participants

Variables			Frequencies	Percentage
Age	10	Female	82	61.2
		Male	52	38.8
	11	Female	82	57.3
		Male	61	42.7
	12	Female	63	49.2
		Male	65	50.8
	13	Female	35	49.3
		Male	36	50.7
Technological tools		Internet	338	71.0
		Smart phones	286	60.1
		Computer	217	45.6
		Tablet	191	40.1

Preferred purposes of internet usage among participants was for course research with 'obtaining information' coming in at 75.4%. Listening to music (71.4%), playing games

(65.3%), e-schooling (58.0%), and watching movies (56.9%) were also significant preferences. Chatting (48.5%), communication (40.5%), downloading programs (30.9%), reading news (17.9%) and meeting new people (16.2%) were the least preferred activities. In addition to this information, students were using the internet for an average of 2.5 years. They reported spending about three hours on the internet daily, excluding distance education and online course participation.

Data Collection Tools

Personal Information Form

A personal information form was prepared to identify demographic characteristics. The following information was collected: gender, age, mother's education level, father's education level, number of siblings, computer, tablet, smartphone ownership, internet connection status, since when the internet was used, frequency of internet usage, time spent on internet excluding distance education and online course participation.

Digital Literacy Scale (DLS)

The Digital Literacy Scale (DLS) developed by Pala and Başıbüyük (2020b) was used to reveal middle school students' digital literacy levels. This scale has a four-factor structure, and the factors were named as "information-processing," "communication," "security," and "problem-solving." It consisted of 21 items of a 5-point Likert-type ("Always = 5", "Often = 4", "Sometimes = 3", "Rarely = 2" and "Never = 1"). DLS was concluded to be a valid and reliable scale. The reliability coefficients of the sub-dimensions and the overall scale were calculated using the current study's data. Therefore, the reliability coefficient of the subdimensions were as follows: "information processing" .670, "communication" .783, "security" .747, and "problem solving" .793. McDonald omega reliability coefficient was calculated as .899 for the overall scale.

Social Media Usage Purposes Scale

The Social Media Usage Purposes Scale, used in the study, was developed by Eren (2014); it aimed to measure middle and high school students' social media usage purposes in two dimensions: interpersonal interaction and lesson preparation. The first factor was named "interpersonal interaction" because it consisted of items expressing individuals' social media usage for interaction purposes. The second factor was named "lesson preparation" because it contained the items expressing individuals' social media usage for

educational purposes. The scale had 12 items of a 5-point Likert scale (1=Never - 5=Always). The 13th item, in which the frequency of social network usage was determined, was updated by obtaining the permission of the research developer. The scale's reliability for the data collected in the current study was .846 for interpersonal interaction and .813 for lesson preparation dimensions. Accordingly, the reliability of the scale was concluded to be very high.

Cyberbullying Threat Level Scale

The Cyberbullying Threat Level Scale developed by Kalender, Bulu, and Keser (2018) was used to reveal the frequency of cyberbullying among middle school students. The scale, which can be applied to middle and high school students, consisted of three main dimensions: Victimization, Bullying, and Witnessing. There were 17 cyberbullying behaviours in each dimension. The danger level of each behaviour was calculated in three sub-dimensions: the frequency of experiencing the behaviour, the perceived severity level, and the perceived negative impact level. The frequency of experiencing the behaviour was answered as 5 point Likert scale (1=Never to 5=Always). Each item's influence was determined by calculating the sum of the scores obtained from these three sub-dimensions. As reported by the scale development study results, all dimensions of the data collection tool had high reliability and aimed to measure the same behaviour. Only the frequency of being exposed to, witnessing, and exhibiting cyberbullying behaviours were addressed in the study. The reliability coefficients of the current study were found to be .913 for victimization, .924 for cyberbullying, and .948 for witnessing.

Data Collection

Before collecting the data, the scales were applied to six female and six male students to see the possible problems. The timing was adjusted according to the received feedback, and the 6th item of the social media scale was revised. The measurement tools were given face to face to the students, and then all the data were collected and transferred to a secure computer.

Ethical Considerations

Ethical and security concerns were also considered during the study. In the study, all participants were asked to fill the informed consent form, and they were free to withdraw from the study at any time without negatively impacting the student or study. Moreover,

the participants were not subjected to harm. Participants' names were not collected in order to protect their anonymity and keep participants' identities confidential.

Ethical approval document was taken from a "Higher Education Institutions Scientific Research and Publication Ethics Directive."

Ethical review board name: Eskişehir Osmangazi University Ethical Review Board

Date of ethics review decision: 24.06.2021

Ethics assessment document issue number: E-64075176-050.01.01-192973

Data Analysis

SPSS 22.0 program was used in the analysis of the data. Descriptive statistics were given as mean, median, and standard deviation. Kolmogorov Smirnow test results, histogram graphs, and skewness-kurtosis values were checked for normality analyses. Information processing, communication, problem-solving, interpersonal communication, and lesson preparation variables showed normal distribution thus, independent samples t-test was used in their pairwise comparisons and one-way analysis of variance (One Way ANOVA) in group comparison. Mann-Whitney U and Kruskal-Wallis tests were preferred for Victimization, Bullying, Witnessing, and Security, which are not normally distributed. Spearman Correlation Analysis was applied to find the relationship between digital literacy level, social media usage purposes, and cyberbullying frequency. All analyses were done in the 95% confidence interval and $p < .05$.

RESULTS

Results of Digital Literacy Analysis

The average scores of the "information processing" and "security" sub-dimensions were 3.74 (σ: .84) and 4.00 (σ: .88), respectively, implying that participants were close to the "Most of the time" option in these dimensions. These findings show that middle school students can process information and ensure personal security in digital environments. On the other hand, the average scores of "communication" and "problem-solving" sub-dimensions were 3.15 (σ: 1.09) and 3.36 (σ: .97), respectively, implying that participants concentrated on the "Sometimes" option in these dimensions. The students participating in the research stated that they sometimes use their skills to communicate with others in digital

environments and solve technical or non-technical problems. Finally, the average of the overall scores obtained from the Digital Literacy Scale was found to be 75.23 (σ: 16.3).

After getting the descriptive statistics of the data obtained from the Digital Literacy Scale, a difference test was performed for gender. Before starting the different tests, assumptions were checked, and the Levene test results checking the normal distribution of the variables were not statistically significant (*p* > .05), showing that the variances of the groups were homogeneous. Thus, independent samples t-test was used to determine whether information-processing, communication, problem-solving and digital literacy scores differ according to gender (Table 2).

Table 2

Independent Samples t-test Results of Information Processing, Communication, Problem Solving and Digital Literacy Whole Scale

		Gender				
	N	**Female** $\bar{\text{x}}$	**Male** $\bar{\text{x}}$	***t***	***df***	***p***
Information Processing	476	18.872	18.446	1.103	474	.271
Communication	476	15.626	15.846	-0.438	474	.662
Problem Solving	476	16.183	17.568	-3.122	474	.002*
Digital Literacy Whole	476	75.256	75.199	0.038	474	.970

Note: * *p* < .05, N: sample size, $\bar{X}$: Mean, *df*: degrees of freedom, *p*: significance level

Middle school students' scores from the "problem-solving" sub-dimension of the Digital Literacy Scale differed significantly by gender (*t*=-3.122, *p*<.05) (Table 2). In other words, male students participating in the study had more problem-solving skills than female students in the digital world. The effect size of this significant difference was calculated with the eta-square coefficient and found to be .020, which can be interpreted as a small effect (Huck, 2008). On the other hand, there was no significant difference in the overall score according to gender. The data of the security sub-dimension did not show normal distribution, therefore non-parametric Mann-Whitney U test was used. The results

showed that the "security" sub-dimension did not differ significantly according to gender ($p > .05$).

Besides gender, the age of middle school students was thought to affect their digital literacy levels. In this context, ANOVA and Kruskal-Wallis tests were used to determine whether the digital literacy levels of the participants changed as their age increased (Table 3).

Table 3

ANOVA Results of Information Processing, Communication, Problem Solving and Digital Literacy Whole Scale

	Sources	df	Sum of Squares	Mean Sum of Squares	F	p
Information Processing	Within groups	3	522.733	174.244	10.510	.000*
	Between groups	472	7825.230	16.579		
Communication	Within groups	3	1342.587	447.529	16.555	.000*
	Between groups	472	12759.861	27.034		
Problem solving	Within groups	3	470.420	156.807	6.895	.000*
	Between groups	472	10734.855	22.743		
Digital Literacy Whole	Within groups	3	10524.658	3508.219	14.315	.000*
	Between groups	472	115673.403	245.071		

Note. * $p < .05$

Information processing, communication, problem-solving sub-dimensions, and overall digital literacy score show statistically significant differences according to age (Table 3). Tukey HSD test was applied to determine the age group from which this difference originated. As reported by the Tukey HSD test results, the digital literacy proficiency of the

students in the 12-13 age group was higher than 10-11-year-old group. 12-13-year-old students use the search engine and the files they get from the Internet more than other ages. Similarly, students of this age group interact more with people through social network platforms. In addition, 12-13-year-old students consider themselves more successful in solving technical and non-technical problems of digital technologies. The effect sizes of the statistically significant information-processing, communication, problem-solving and overall score differences were .06, .09, .04, and .08, respectively. These results show that the age variable has a small effect on these variables (Huck, 2008).

The results of "security" sub-dimension showed that this sub-dimension differed according to age (Chi-square= 20.20 sd=3, $p <$ .05). As stated in the pairwise difference analysis results, the students in the 12-13 age group got higher scores for "security" than the students in the 10-11 age group. This result show that students pay more attention to safety in digital environments as they get older.

Results of Social Media Usage Purposes Analysis

Descriptive statistics were calculated. Students' average usage score was 2.62 (σ: 1.02) for interpersonal interaction and 3.21 (σ: 1.01) for lesson preparation. These findings show that middle school students "sometimes" use social media for interpersonal interaction and lesson preparation.

After determining students' social media usage purposes, social network platforms preferred by the participants were examined. Students rated various social media platforms between 1 and 5; the most used platform is Youtube, with an average of 3.94. After Youtube, the most used social media applications are Whatsapp ($\bar{X}$: 3.78), Instagram ($\bar{X}$: 2.78) and Tiktok ($\bar{X}$: 2.61). These were followed by Discord ($\bar{X}$: 1.91), Telegram ($\bar{X}$: 1.71), Facebook ($\bar{X}$: 1.56), Twitter ($\bar{X}$: 1.51), Messenger ($\bar{X}$: 1.49), and Skype ($\bar{X}$: 1.26). The other options included Twitch, Snapchat, and Pinterest.

The differentiation of social media usage purposes according to gender was tested. As the required assumptions were met, the data belonging to interpersonal interaction and lesson preparation sub-dimensions were analyzed with independent samples t-test (Table 4).

Table 4

Independent Samples t-test Results of Interaction Between Individuals and Preparation for The Course

		Gender				
	N	Female	Male	*t*	*df*	*p*
Interaction between individuals	476	17.967	18.748	-1.190	474	.235
Preparation for the course	476	16.796	15.838	2.068	474	.039*

Note. * *p* < .05

Only the lesson preparation dimension differed significantly according to gender (*t*: 2.068, *p*<.05)(Table 4). Female students in middle school use social media more for lesson preparation than male students. The effect size calculated by partial eta-square was .009, indicating a very small effect.

A one-way variance analysis (ANOVA) was conducted with age groups and social media usage purposes as a dependent variable. The results are presented in Table 5.

ANOVA was applied to determine whether middle school students' social media usage purposes differ according to age, and the results are presented in Table 5.

Table 5

ANOVA Results of Interaction Between Individuals and Preparation for The Course

Variables	Sources	*df*	Sum of Squares	Mean Sum of Squares	F	*p*
Interaction between individuals	Within groups	3	1951.290	650.430	13.871	.000*
	Between groups	472	22132.741	46.891		
Preparation for the course	Within groups	3	62.503	20.834	.816	.484
	Between groups	472	12006.392	25.437		

Note. * *p* < .05

According to the ANOVA results, age was not effective in middle school students' social media usage for lesson preparation (F(3, 472): .816, $p > .05$) (Table 5). However, middle school students' social media usage for interpersonal interaction differs according to age (F(3, 472): 13.871, $p<.05$). The variances of the groups were homogeneous therefore, the Tukey HSD test, one of the Post-hoc tests, was applied.

Tukey HSD test results indicated 12-13-year-old students differ from other age groups in the interpersonal interaction sub-dimension. Specifically, 12-13-year-old students use social media more for interpersonal interaction than 10-11-year-old students. These results are similar to the findings obtained from Digital Literacy Scale's communication sub-dimension. Partial eta-square was calculated to determine the effect size and found to be .08. This result shows that the effect of the age variable is small (Huck, 2008).

Results of Frequency of Experiencing Cyberbullying Analysis

Central tendency measures and interquartile ranges of witnessing, exhibiting, and exposure sub-dimensions were calculated to determine the frequency of experiencing cyberbullying among middle school students participating in the study.

The lowest score from the sub-dimensions of the cyberbullying frequency scale was 17, and the highest score was 85. The median of witnessing, exposure, and exhibition were 20, 19, and 17, respectively. Interquartile ranges (Q3-Q1) were found to be 11, 7, and 5, respectively. As reported by these results, middle school students' levels of witnessing, exhibiting, and exposure to cyberbullying were between "never" and "rarely." In other words, the frequency of experiencing cyberbullying among middle school students was low. The frequency and percentages of bullying behaviours of students who have experienced cyberbullying at least once were shown in Table 6.

Table 6

Frequency and Percentages of Bullying Behaviours Of Students Who Had Experienced Cyberbullying At Least Once

Bullying Behaviours	Exposed		Exhibiting		Witnessing	
	f	%	f	%	f	%

Giving rude nicknames	148	31.1	89	18.7	178	37.4
Abusing	35	7.4	13	2.7	61	12.8
Moking	153	32.1	91	19.1	192	40.3
Spreading rumors/gossip	114	23.9	76	16.0	157	33.0
Deception	123	25.8	97	20.4	151	31.7
Intimidating	167	35.1	136	28.6	174	36.6
Insulting	126	26.5	86	18.1	145	30.5
Sharing a personal photo or video of someone without permission	38	8.0	37	7.8	71	14.9
Virtual deception (Pretending to be someone else)	70	14.7	59	12.4	102	21.4
Sending unwanted words or photos of a sexual nature	32	6.7	22	4.6	50	10.5
Making a sexual offer	32	6.7	23	4.8	43	9.0
Making calls by hiding the number	59	12.4	51	10.7	90	18.9
Creating an embarrassing or offensive web page (Website, a Facebook page) about someone	35	7.4	30	6.3	53	11.1
Sending malicious email	30	6.3	33	6.9	51	10.7
Kicking someone out of a chat room or a virtual game	134	28.2	115	24.2	145	30.5
Exhibiting hostile behaviors towards someone	96	20.2	87	18.3	124	26.1

Entering someone else's computer or mobile phone, changing the password without permission	52	10.9	32	6.7	67	14.1

The most common events encountered by students who have experienced cyberbullying were intimidating and mocking. These behaviours were followed by giving rude nicknames, kicking someone out of a chat room or a virtual game, insulting, deceiving, and spreading rumours/gossip.

Mann-Whitney U test was used to determine the differentiation in exposure, exhibiting, and witnessing dimensions according to gender (See Table 7).

Table 7

Mann Whitney U Test Results of Victimization, Bullying and Witnessing

	Gender			
Variables	**Female**	**Male**	**U**	***p***
Victimization	226.98	252.60	25017.0	.036*
Bullying	225.15	254.85	24536.0	.012*
Witnessing	238.75	238.19	27967.5	.964

Note. * $p < .05$

Significance test results showed Exposure and Exhibiting sub-dimensions differed according to gender. Male students are more exposed to cyberbullying and exhibit cyberbullying more than female students. The gender had no effect for witnessing sub-dimension (U= 27967.5, $p > .05$). Consequently, female students and male students witnessed cyberbullying at the same level.

The Kruskal-Wallis test was used to determine whether the sub-dimensions of the middle school students' cyberbullying threat level scale differ according to age (Table 8).

Table 8

Kruskal Wallis Test Results of Victimization, Bullying and Witnessing

Variables	Age				Chi-square	df	p
	10	11	12	13			
Victimization	223.98	226.11	241.86	284.82	11.591	3	.009*
Bullying	228.04	218.17	246.50	284.77	14.173	3	.003*
Witnessing	211.49	233.44	233.88	308.01	24.763	3	.000*

Note. * $p < .05$

As stated in the Kruskal Wallis test results, witnessing, exhibiting, and exposure levels varied according to age (Table 8). Non-parametric difference tests were performed in pairs (10 and 11, 11 and 12, 10 and 12, 11 and 13, 12 and 13) to see the source of the differentiation. As a result, 13-year-old students differed significantly from other ages in witnessing, exhibiting, and exposure sub-dimensions. In other words, 13-year-old students were more exposed to cyberbullying, witnessed and exhibited cyberbullying more than other age groups.

The Relationship Between Digital Literacy, Social Media Usage Purposes, and Cyberbullying Threat Level

The correlation coefficients between the variables were given in Table 9.

Table 9

Correlation Matrix Between Digital Literacy, Social Media Usage Purposes and Siber Bullying

	1	2	3	4	5	6
1. Digital Literacy	-					
2. Interaction between individuals (SMUP)	.507**	-				
3. Preparation for the course (SMUP)	.309*	.374**	-			

4. **Victimization (CB)**	.110*	.331**	.027	-		
5. **Bullying (CB)**	.087	.275**	.015	.756**	-	
6. **Witnessing (CB)**	.171**	.297**	.036	.727**	.696**	-

Note. * *p* <.05, ** *p*< .001, SMKA: Social Media Usage Purposes, CB: Cyber Bullying

Spearman correlation coefficients demonstrated middle school students' digital literacy levels had a moderate and positive relationship with interpersonal interaction and lesson preparation sub-dimensions. According to these results, as middle school students' digital literacy levels increased, their social media usage for interpersonal interaction and lesson preparation increased. In addition, digital literacy showed a weak but positive relationship with exposure to and witnessing cyberbullying —exposure to and witnessing cyberbullying increased slightly as middle school students' digital literacy level increased.

The interpersonal interaction variable, one of the sub-dimensions of the Social Media Usage Purposes Scale, was moderately and positively related to being exposed to cyberbullying. As middle school students' social media usage for interpersonal interaction increased, the frequency of being exposed to cyberbullying also increased. On the other hand, the interpersonal interaction variable was positively but weakly related to exhibiting and witnessing cyberbullying, indicating that the frequency of exhibiting and witnessing cyberbullying increased as social media usage for interpersonal interaction increased. No significant relationship was found between social media usage for lesson preparation and exposure to, exhibiting, and witnessing cyberbullying (p>.05).

On the other hand, the interpersonal interaction variable was positively but weakly related to exhibiting and witnessing cyberbullying variables, showing that the frequency of exhibiting and witnessing cyberbullying also increased as social media usage for interpersonal interaction increased. No significant relationship was found between social media usage for lesson preparation and exposure to, exhibiting, and witnessing cyberbullying (p>.05).

The correlations of cyberbullying threat level scale's sub-dimensions were calcuated and a high and positive relationship was found between exposure, witnessing, and

exhibiting sub-dimensions. Accordingly, as the frequency of exposure to cyberbullying increased, the frequency of witnessing and exhibiting increased, or as the frequency of witnessing cyberbullying increased, the frequency of exhibiting or being exposed to cyberbullying increased.

CONCLUSION, DISCUSSION AND SUGGESTION

In this study, middle school students' digital literacy levels, social media usage purposes, and the cyberbullying threat level were investigated, and the relationship between these variables was analyzed.

First, digital literacy levels were analyzed for various variables. According to the findings of the study, the average of middle school students' digital literacy levels was close to the value found in the study conducted by Pala and Başıbüyük (2020a) with middle school 5th graders. The findings of the two studies support each other, concluding that middle school students were digitally literate individuals. Middle school students' digital literacy skills were tested according to gender. No significant difference was found in the Digital Literacy Scale according to gender. Recent studies in the literature also show that gender did not affect digital literacy (Argelagós & Pifarré, 2017; Liang et al., 2021; Pala & Başıbüyük, 2020a), which supported the findings of the current study. As expected, 12-13-year-old students' digital literacy skills were higher than 10-11-year-old students in all sub-dimensions and overall. Various studies reported that digital literacy increases as students' grades increase (Jin et al., 2020). In addition, this is in line with the increase of young people's technology-based experiences with age.

Secondly, social media usage purposes were analyzed for various variables. Social media has become widespread among children and young people because of its high interaction (Ahn, 2011; Carter, 2013; Lev-on, 2017; Reid & Weigle, 2014; Tartari, 2015; Williams & Ricciardelli, 2014). Facebook, Youtube, Whatsapp, and Instagram were the most preferred social media platforms among students (Dhir & Tsai 2017; Eren, 2014; Tuğlu, 2017; Uyar & Asrak-Hasdemir, 2021). The current study data had also shown that Youtube is the most used platform, followed by Whatsapp, Instagram, and Tiktok. About the usage purposes of these platforms, students "sometimes" preferred to use them for interpersonal interaction and "sometimes" for lesson preparation. The differentiation of social media

preferences can be explained by the change in students' usage purposes as technology and digitalization increase. Before the pandemic, students mainly used social media to have fun and spend their spare time (Gedik & Coşar, 2020; Güney, 2020); on the other hand, after the pandemic, they mostly used it for watching lesson videos, conducting research, and getting information. The difference analysis demostrated that female students use social media for lesson preparation more than males. In the study conducted by Eren (2014), the scores of the girls were higher than the boys in the lesson preparation dimension, but there was no significant difference between the groups. There is no significant differentiation in the interpersonal interaction sub-dimension of social media usage purposes according to gender.

On the other hand, the study conducted by Eren (2014) showed that boys used social media for interaction purposes more than girls. These conflicting results could be explained by the development of the digital world and changing social media platforms. The social media platforms designed in the 2010s were to share daily life, whereas they became an informal learning environment in the 2020s. Regardless of gender, students' social media activities change as they get older. While children got older, their disposition towards meeting new people on social media, sharing with their friends, and staying in touch with people increased. On the other hand, no significant difference was found in the interpersonal interaction dimension according to the age of the students in the study conducted by Eren (2014).

Being exposed to or exhibiting cyberbullying was enhanced with the increase in the use of social media in children (Baştürk, 2020; Güler, 2019). However, witnessing, exhibiting, and being exposed to cyberbullying frequencies were low in the current study. Similarly, a small number of students were cyber victims and cyberbullies in studies conducted in the literature (Ayas & Horzum, 2012; Kowalski & Limber, 2007). The relationship between cyberbullying and being exposed to cyberbullying and gender had been investigated in the literature (Kowalski & Limber, 2007; Ybarra & Mitchell, 2004). The current study results showed no significant difference in witnessing cyberbullying according to gender, whereas male students were more exposed to cyberbullying than female students and exhibited cyberbullying more. In some studies with middle school students, male students were more cyberbullies than females, which supports the findings of the research (Ex: Baştürk-Akca, et

al., 2015; Dilmaç, 2009; Gencer, 2017; Peker, 2015; Özkan, 2019; Öztürk, 2019). Male students had easier access to the internet, prefered more war-based games more in their digital game preferences, and reacted more to negative situations they encounter on the internet than girls, which may have encouraged boys to bully more often than girls (Özkan, 2019). On the other hand, some studies in the literature found that girls were more exposed to cyberbullying than boys (Akbaba & Eroğlu, 2013; Dilmac, 2009; Kowalski & Limber, 2007). Regarding the age groups, 13-year-old students witness more cyberbullying, exhibit more cyberbullying, and are more exposed to cyberbullying than other age groups. In the studies conducted by Özkan (2019) and Gencer (2017), the observation that the level of cyber victimization increases as the grade level increases supports the study. In addition, in the study conducted by Beder and Ergün (2015), the internet awareness of 8th-grade students was lower than 6th-grade students; it was stated that this might be due to the middle school seniors' desire to behave more relaxed and freely. This freedom may also cause students to be more exposed to cyberbullying. In other words, although digital literacy skills increase as the grade level increases, the Internet is not used consciously in higher grades (Gökçearslan & Seferoğlu, 2016).

Finally, the study examined whether there was a relationship between middle school students' digital literacy, purposes of social media usage, and cyberbullying frequency. As stated in the analysis results, there was a moderate positive relationship between middle school students' digital literacy levels and interpersonal interaction and lesson preparation sub-dimensions of social media usage purposes. Besides, digital literacy had a weak positive relationship with being exposed to and witnessing cyberbullying. As middle school students' digital literacy levels increased, being exposed to and witnessing cyberbullying also increased. In the studies, teachers suggested increasing students' digital literacy to protect them from cyberbullying (Wnęk-Gozdek et al., 2019). In this study, the frequency of being exposed to and witnessing cyberbullying of digitally literate students was expected to be low. The presence of a positive relationship, albeit weak, contributed to the literature. Similarly, a study conducted in German schools showed that social media literacy did not affect cyber victimization (Müller et al., 2014). The interpersonal interaction, one of the sub-dimensions of the Social Media Usage Purposes Scale, was moderately positively correlated with exposure to cyberbullying and weakly positively correlated with exhibiting and

witnessing cyberbullying. In particular, people who used social media to chat, shared photos and looked at other people's photos were more exposed to cyberbullying. Studies in the literature demostrated that young people who use social media were more exposed to cyberbullying and become cyberbullies (Uludasdemir & Kucuk, 2019). In particular, Instagram, Twitter, Snapchat, and Tumblr were the social media platforms where young people exhibited and were exposed to most cyberbullying behaviours.

The suggestions submitted in light of the results of this study are presented below.

This study found that the students' digital literacy was at a moderate level. Due to Covid 19, students had to interact more with the digital world; the lessons taught online and the homework given on digital media increased students' digital experiences. Hence, students' awareness of digital and media literacy might be improved by getting help from different disciplines.

With the pandemic, students' internet access mainly occured at home. Therefore, it was necessary to take various precautions in the home environment as in every environment. Young people should be trained about the dangers they may encounter on the internet in the process of advancing from digital literacy to digital citizenship. At this point, parents have important responsibilities. The increase in parents' education level, internet skills, and parental control reduced cyberbullying on students (Akbaba & Eroğlu, 2013). Information security awareness can be created for parents by giving them awareness seminars on cyberbullying risks. Projects promoting conscious internet usage by providing every student with technological tools and easy access to the internet can eliminate inequality among students.

In this study, the students' social media usage for interpersonal interaction and lesson preparation was moderate. Adopting an interdisciplinary educational approach in all courses, especially computer, science and technology, and social studies in schools, may ensure that students acquire the necessary knowledge on digital literacy, social media usage, and cyberbullying. In addition, the relationship of this knowledge with the academic success of the students can be revealed.

From this research, the results of the cyberbullying scale's sub-dimensions showed that witnessing, exhibiting, and exposure levels were low. Coping with cyberbullying can

be researched, and recommendations can be made to allocate the right resources. The most common events experienced by students who have experienced cyberbullying at least once in terms of exposure, witnessing and exhibiting, are intimidation, mocking, giving rude nicknames, kicking someone from a chat room or a virtual game, insulting, deceiving, and spreading rumours/gossip. Advertisement campaigns containing the desired behaviours as public service ads can be organized on the internet to reduce students' cyberbullying tendencies. Besides, to find solutions to such problems also experienced by teachers in online education environments, screening studies can be conducted, frequently experienced behaviours can be revealed, and in-school activities can be carried out with the participation of guidance teachers.

In addition, the psychological and sociological reasons underlying the increase in cyber victimization and witnessing level as students' digital literacy levels increase can be investigated through qualitative studies. In addition, students' digital literacy, social media usage purposes, and the frequency of cyberbullying/being exposed to cyberbullying/witnessing cyberbullying can be examined according to many variables, such as settlement and family income.

Although students' frequency of experiencing cyberbullying was low, social media usage was associated with exhibiting and experiencing cyberbullying behaviours. Although some relationships were found between digital literacy and social media usage purposes and cyberbullying in the current study, there were some limitations. For example, the data on cyberbullying was prepared only according to the participants' statements, suggesting the possibility of manipulation. Although no information that would reveal the participants' identities was collected during the study, it cannot be ensured that the students gave honest answers due to their age. Future studies can further the results of the current study by using experimental or time series models against potential problems. In addition, the relationships between these variables can be reviewed by monitoring students' digital literacy skills and cyberbullying behaviours using digital technologies. In this study, individual factors related to students' digital literacy levels were taken into account. However, different studies should be conducted by considering the variables affected by students' social environment, such as socio-economic level and parents' awareness. Finally, there was no cause-effect relationship in the hypotheses of the current study. Future studies can establish structural

equation models, consider the direction of the relationships between variables and test the hypothesized model's accuracy by applying it to large samples.

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