

Fake digital identity and cyberbullying

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Abstract

This study aims to determine whether or not there is an association between creating fake user accounts and engaging in behaviors deemed to constitute cyberbullying. A quantitative research methodology was used with a clear descriptive and interpretative intent. The sample comprised 1989 adolescents aged between 10 and 17 years from five regions in Southern Europe, who completed an online questionnaire. The results reveal that adolescents aged 16 years were the ones who engaged most in cyberbullying actions. Those who created false profiles tended to engage in more behaviors linked to cyberbullying. Adolescent social media users were mainly older boys who engaged more in cyberbullying behaviors. Relatively few adolescents claim to engage regularly in behaviors linked to cyberbullying. The study concludes that there is an urgent need to provide adolescents with training in the responsible use of digital technologies at an earlier age, before they begin using them assiduously.

Keywords

cyberbullying, fake identity, fake profiles, identity theft, social media

Introduction

The Internet has changed the way we communicate and relate to others. It has also changed the way we work, how we acquire knowledge and how we spend our leisure time (Gairín et al., 2014). The highest rates of Internet use are found among adolescents, who are assiduous users of social networking sites and instant messaging applications (INE, 2019).

To register on a social media site, all an individual has to do is have an email account, establish a password and create a profile. Although the vast majority of social media sites specify in their terms and conditions that the use of fake profiles is strictly prohibited, they have no tools to detect them. Creating a fake profile is a type of identity theft that makes it easier for an individual to engage in online extortion through activities such as phishing, grooming, and cyberbullying, for example (Escribano et al., 2019).

An identity is only considered real if it has been verified by a national state authority. Said authority provides guarantees that the name, photo, fingerprints and date of birth that feature on a passport or ID card, for example, all belong to the same person. On the social media, a user identifies him or herself through their profile. In general, profiles feature a photograph, a name and (sometimes) an address, and date of birth. However, the companies administering these websites do not carry out vigorous checks to determine whether users' true identities coincide with their profiles. A fake identity is when someone uses someone else's identity. A fake profile is when someone uses an invented name not attached to any real person (Romanov et al., 2017).

Marshall and Tompsett (2005: 128) define identity theft as 'the acquisition of sufficient data for one individual to successfully impersonate another'. Although this is not theft per se, it certainly defines the concept in such a way as to encompass the majority of cases commonly described as identity theft. Although this study dates from over 15 years ago, it is still relevant today, since it describes offline impersonations that are still carried out in the same way today, only in an online format. According to the authors, the reasons for identity theft can be grouped into three categories. (1) Personal: personal identity theft aimed at impersonating someone for recreational reasons that may range from revenge to financial fraud (in online purchases or the sending of false e-mails, etc.). (2) Corporate: corporate identities are often stolen or falsified with the aim of creating a vehicle for criminal activity (phishing). (3) Network: network identity is associated with a corporate or personal identity that can be stolen or falsified (spyware, web scraping).

An individual may have multiple identities on the social media, and there are even bots or robots that are programmed to create fake profiles automatically with the aim of flooding the net with spam or generating likes or influence (Baeza-Yates, 2020). Adikari and Dutta (2020) published a method for identifying fake LinkedIn profiles that was 87% accurate. One way of identifying fake profiles is to measure the popularity garnered by a person or institution on the social media, based on the number of followers they have, something which has important psychological, economic and even political implications. Fake profiles are created for many different reasons, including winning trust and attracting attention, but Gurajala et al. (2016) found that the number of friends and followers on a social media site tends to increase over time in the case of fake profiles and decrease over time in the case of real ones.

In general, fake profiles usually feature a false name and a false age. In a study carried out in the United States, 26% of the young people interviewed admitted to giving false

information (name, age, or residence) to protect their privacy (Madden et al., 2013). We believe this is a significant figure, although it is true that, on many occasions, this type of action is done to circumvent age restrictions. Almansa et al. (2013) found that 45% of profiles used a false name. Minors consider these lies to be normal and simply a means of adapting to online/offline contexts and situations. The normalization of lying at an early age generates mistrust among peers and serves to protect those who engage in aggressive online behavior (Caro Samada, 2015).

Cyberbullying is defined as a violent, intentional and repeated act carried out among minors through digital devices and the Internet (smartphones, tablets, social networking sites, and instant messaging apps). Some of the most frequent manifestations of cyberbullying include sending frequent offensive messages, spreading unpleasant rumors about the victim, recording videos of attacks and posting them on line, identity theft, and intentionally excluding someone (Luengo, 2014). Cyberbullying has many different consequences, including suicidal behaviors (Buelga et al., 2022), cybervictimization (Marciano et al., 2020), poor family relationships, an authoritarian parenting style, and poor peer relations (Duarte et al., 2018; Hong et al., 2018).

According to UNESCO (2019), 32% of children and adolescents have been bullied by their school mates and 1 out of 10 (10%) have been the victims of cyberbullying during the past month. In European countries, verbal bullying and social exclusion are the most frequent types of peer aggression.

Harassment and intimidation with the intention of hurting, insulting, humiliating, or slandering often result in the social exclusion of the victim, which in turn leads to the breakdown of their social bonds, causing isolation, and abandonment (Agustina et al., 2020). However, this situation can also lead to exclusion from the social media, particularly when embarrassing photos or videos are shared, rumors spread, or personal information shared without the victim's consent (Ballesteros et al., 2017).

It is important to highlight that the principal roles linked to cyberbullying are that of cybervictim (i.e. the person being bullied), cyberaggressor (i.e. the person doing the bullying), and cyberobserver (i.e. those who passively observe the bullying without intervening) (Escortell et al., 2020). However, different studies in Spain and Europe focusing on the same age group as that studied here report different results. In a study with children in Cantabria (Spain), Fernández-Tomé (2015) found the following percentages: cybervictims: 43.9%, cyberaggressors: 23.6%, and cyberobservers: 76.9%. In a study carried out in the Basque Country, again with children, Garaigordobil (2013) found lower percentages: cybervictims: 30.2%, cyberaggressors: 15.5%, and cyberobservers: 65.1%. In the Autonomous Community of Madrid, the percentage of cyberaggressors was 19.5% (Barbero, 2017), and in Galicia it was 30.6%, with 84.7% claiming never to have perpetrated cyberbullying and 11.6% admitting to having perpetrated it on occasions (Dominguez-Alonso et al., 2017). In Italy, 11% of students admitted to having participated in cyberbullying as aggressors, and 15% as victims (Palermi et al., 2017). Finally, in Greece, only 6.6% admitted to having perpetrated cyberbullying, whereas 7.3% claimed to have been victims of this type of aggression (Tsimtsiou et al., 2017).

In terms of age, in Cantabria, the age group with the lowest percentage of cybervictims and cyberaggressors was 12–13 years; the percentage of cyberaggressors increased in the 14–15-year-old group and remained stable until the age of 20. In terms of gender, 37% of

victims were male and 50.5% female, with these percentages being 24% and 23.2% (respectively) among aggressors (Fernández-Tomé, 2015). In the Basque Country, the 14–15-year-old group was the most vulnerable in terms of involvement in cyberbullying behaviors, as well as in terms of the number of cyberbullying behaviors carried out, suffered and observed. Results were similar for both boys and girls, although the percentage of male aggressors was higher than that of female ones (Garaigordobil, 2013). In the Autonomous Community of Madrid, the percentage of cyberaggressors was 16.1% among those aged 12–13 years, then rose to 22.8% among those aged 14–15 years, and decreased once again to 19% at age 16. The percentage of cyberaggressors was higher among boys (25.1%) than among girls (13.7%) (Barbero, 2017). Similar results were reported for Galicia, where cyberbullying was found to be more prevalent among those aged 13–15 years and less prevalent among those aged 12 years. Girls were more likely to be victims of cyberbullying than boys (Dominguez-Alonso et al., 2017).

The cyberbullying prevalence rates reported in these studies vary. According to Garaigordobil (2011), the reason why data are not easily comparable is that, in many cases, studies use different questionnaires and have and use different procedures, designs, and statistical analyses. Also, the age groups or school years studied are sometimes different, thereby precluding comparisons. The present study therefore analyzes data from different regions and countries that have been obtained using the same procedures, designs, statistical analyses, and measurement instruments.

Fake profiles are tools commonly used by those intending to engage in illegal activities such as slander, extortion, threats, fraud and, in the worst cases, child abuse, cyberbullying, and grooming. What are fake profiles used for? Temperini and Macedo (2015) classify different types of fake profiles in accordance with the purposes for which they are created. The principal ones are as follows: Stalker: used to observe and obtain information about other profiles on the social media. Cyberbullying: used to bully peers by insulting, attacking and sending threatening messages from the anonymity bestowed by a fake profile. Gamers: used to obtain benefits, such as credits or lives in online games. Digital reputation: category of fake profiles used to gain digital notoriety by generating likes. Cybercrime: used to perpetrate different types of computer crimes, such as phishing, grooming, hacking, cracking, service denial, threats, extortion, and spreading malware, among others.

One of the most common forms of carrying out cyberbullying is through identity theft, where the aggressor creates fake profiles attributable to the victim. Another method is to access the victim's user profile on different social media sites in order to use their identity to contact other people or post comments in their name (Pujol et al., 2016). In cyberbullying there is a clear attempt to remain anonymous by using fake profiles, since this enables aggressors to bypass social constraints, behavioral norms, and even the legal consequences of their actions (González-Pérez, 2018). All these papers attest to the importance of the research carried out in the present study, which presents new findings on the relationship between identity theft and cyberbullying.

Few studies exist on the social media sites most commonly used by adolescents to engage in identity theft and cyberbullying. Of all the social media, Facebook is one of the most commonly used by those who create fake profiles, since it is an anonymous means of communication that enables open, consequence-free access. It is also the social networking site most commonly used for cyberbullying (Chan et al., 2019; González-Pérez, 2018).

This paper aims to respond to the following research questions: What risk behaviors linked to cyberbullying do adolescents engage in? Is there an association between fake identities and cyberbullying? Do risk behaviors linked to cyberbullying vary in accordance with variables such as age or gender? What social media sites are used for behaviors linked to cyberbullying?

The aim is to determine whether there is an association between creating fake user accounts on social networking sites or instant messaging apps, and engaging in cyberbullying behaviors (insulting or posting texts or photographs with the intention of hurting someone, etc.).

Methodology

The study presented here forms part of a broader research project that aims to explore inadequate uses of digital technologies and the perception held by different segments of the population regarding inappropriate behaviors linked to the use of the social media.

It is a quantitative study that follows a descriptive and interpretative design and is clearly correlational in nature. The survey methodology used was based on the guidelines developed by Lumsden (2007). First of all, the study was defined by dividing the research questions into categories. Next, the target audience was defined and the content designed. Finally, a pilot-test survey was carried out and the online questionnaire was created following the recommendations established by Norman et al. (2001), Eysenbach (2004), and Regmi et al. (2017).

Participants

Participants were 2529 children and adolescents aged between 10 and 17 years from seven different regions in Southern Europe, five in Spain (Basque Country ($N = 972$), Navarra ($N = 389$), Galicia ($N = 512$), Madrid ($N = 114$), and Cantabria ($N = 149$)), one in Greece (Athens ($N = 291$)), and one in Italy (Urbino ($N = 102$)). In terms of gender, 49.9% were boys ($N = 1263$) and 50.1% were girls ($N = 1266$). The sample was accessed thanks to the collaboration of different schools in the aforementioned regions (Table 1).

Instruments

The part of the questionnaire to which the present study refers comprises eight items that describe behaviors compatible with cyberbullying carried out on social networking sites or through instant messaging apps. Respondents were asked to state how often they engaged in the behaviors described in each item, with answers being given on a four-point Likert-type scale ranging from 1 = never to 4 = always. The Cronbach's alpha for this scale was 0.843. The behaviors defined were as follows:

Item 1: I make negative comments about classmates in public

Item 2: I threaten classmates

Item 3: I post lies about other people

Table 1. Age of the minors in terms of social networking sites and instant messaging apps used.

	Frequency	%	% Valid	Accumulated %
Valid				
10	191	7.6	7.6	7.6
11	317	12.5	12.5	20.1
12	507	20.0	20.1	40.2
13	462	18.3	18.3	58.4
14	443	17.5	17.5	75.9
15	415	16.4	16.4	92.4
16	139	5.5	5.5	97.9
17	54	2.1	2.1	100.0
Total	2528	100.0	100.0	
Missing	1	0.0		
Total	2529	100.0		

Item 4: I make comments that encourage bullying (picking on someone)

Item 5: I spread rumors or hurtful comments

Item 6: I post embarrassing photos or videos of my classmates without them knowing it

Item 7: I post photos or comments that encourage bullying among my classmates

Item 8: I resend or share photos and videos that may hurt other people

The questionnaire also included two questions referring to the setting up of accounts under an identity other than their true one. The first is linked to the setting up of accounts under a fake name, and the second to giving a fake age. Both questions were presented with the same four-point Likert-type scale, with respondents being asked to rate the frequency with which they lie about their age and name when setting up accounts.

Finally, in addition to being asked for certain sociodemographic information (geographical region, age, and gender), respondents were also given a list of social networking sites and instant messaging apps and asked to state which ones they used (I use – I don't use).

Procedure

The first step was to select the schools in which the questionnaires were to be administered. With the intermediation of different collaborators, the research team contacted the management teams of each school to explain the nature of the study. Once this first phase had been completed, the data were collected in the schools themselves by means of an online questionnaire. Questionnaires were completed in class time in the presence of collaborating members of the research team, after the minors' families had given their informed consent. Participants were assured that their answers would be totally

anonymous and that their participation was strictly voluntary. They were also told that they could withdraw from the study at any moment.

Data analysis

The data obtained were analyzed using the SPSS 25.0 statistical program. Descriptive analyses (Mean, Standard deviation, Minimum, and Maximum) were performed, along with frequency and percentage distribution analyses, means comparison tests (ANOVA and *t*-test), post-hoc tests (Tukey), and Pearson correlation analyses. The effect sizes were estimated using Cohen's *d* (Cohen, 1977). These and the analysis test were carried out to fulfill the study aims and answer the research questions.

Results

The results are divided into three sections. In the first one, we outline the most common actions linked to cyberbullying carried out on the social media, specifying the age and gender groups in which they are most widespread. The second section presents the correlations found between actions linked to cyberbullying and the use of fake user names and ages when registering on social networking sites or instant messaging apps. Finally, the third section analyzes the social media sites most commonly used by those engaging in the highest number of actions linked to cyberbullying.

The first and third sections are clearly linked to the review carried out in the Introduction of the extant literature on cyberbullying, its consequences and its prevalence among different age groups. The second section, on the other hand, is associated with the review focusing on fake user accounts, impersonation and identity theft.

Part 1: Behaviors linked to cyberbullying, age, and gender.

The results revealed that, in the age range on which the study focused, the mean frequency with which children and adolescents engage in behavior linked to cyberbullying is very low, with the mean for the composite variable (cyberbullying) being 1.18 (within a range of 1–4). Scores above the mean were only found for three behaviors: spreading rumors or hurtful comments (M: 1.19), making negative comments about classmates in public (M: 1.26), and particularly, posting lies about other people (M: 2.20, Table 2).

If we analyze the results in relation to the independent variables age, gender, and geographical region, we see that statistical differences exist in two of these (age and gender), although no differences were observed in relation to geographical region of origin. In terms of age, in general, older participants tended to engage in more cyberbullying behaviors over the social media. At age 10, the mean for this type of behavior is extremely low (M: 1.03), while at age 16 (the age for which the highest value was observed), the mean was 1.29. From this age onward values decrease slightly (at age 17, M: 1.23, Table 3).

A detailed post hoc Tukey analysis, performed to determine the groups between which differences existed, revealed four different groups. The first one comprised children aged between 10 and 12 years with a very low level of cyberbullying behaviors (mean of

Table 2. Behaviors linked to cyberbullying.

	<i>N</i>	Minimum	Maximum	Mean	Standard deviation
I make negative comments about classmates in public	2490	1	4	1.26	0.559
I threaten classmates	2481	1	4	1.14	0.463
I post lies about other people	2211	1	3	2.20	0.858
I make comments that encourage bullying (picking on someone)	2480	1	4	1.13	0.406
I spread rumors or hurtful comments	2475	1	4	1.19	0.495
I post embarrassing photos or videos of my classmates without them knowing it	2455	1	4	1.11	0.401
I post photos or comments that encourage bullying among my classmates	2452	1	4	1.09	0.384
I resend or share photos and videos that may hurt other people	2448	1	4	1.13	0.434
Composite variable: cyberbullying	2122	1.00	4.00	1.18	

Table 3. Actions linked to cyberbullying by age.

	<i>N</i>	Mean	Standard deviation	Standard error	95% Confidence interval for the mean		Minimum	Maximum
					Lower limit	Upper limit		
10	180	1.0340	0.14880	0.01109	1.0121	1.0559	1.00	4.00
11	301	1.0482	0.15667	0.00903	1.0304	1.0659	1.00	4.00
12	483	1.0963	0.23333	0.01062	1.0754	1.1171	1.00	4.00
13	432	1.1800	0.32716	0.01574	1.1490	1.2109	1.00	4.00
14	404	1.1674	0.29853	0.01485	1.1382	1.1966	1.00	4.00
15	390	1.1782	0.29951	0.01517	1.1484	1.2080	1.00	4.00
16	130	1.2952	0.46328	0.04063	1.2148	1.3756	1.00	4.00
17	52	1.2332	0.52687	0.07306	1.0865	1.3799	1.00	4.00
Total	2372	1.1402	0.29546	0.00607	1.1283	1.1521	1.00	4.00

between 1.03 and 1.09; $p=0.461$). The second comprised children and adolescents aged 12–15, in which the mean was between 1.09 and 1.18 ($p = 0.114$). The third comprised adolescents aged 13–15, as well as some 17-year-olds, and had a slightly higher mean (between 1.17 and 1.23; $p = 0.385$). And finally, the fourth group encompassed older participants, aged 16 and 17, with a mean of between 1.23 and 1.29 ($p=0.466$) for behaviors linked to cyberbullying.

The gender analysis revealed that boys scored higher than girls (M: 1.18 and M: 1.09, respectively) in the scale of behaviors linked to cyberbullying, with these differences being significant ($p=0.000$). The effect size of these differences ranged from small ($d=0.20$) to moderate ($d=0.50$), with a Cohen's d of 0.291.

Table 4. Association between behaviors linked to cyberbullying and the setting up of accounts under a fake name or age.

	When I set up an account I don't give my real age	When I set up an account I use a fake name	Cyberbullying
When I set up an account I don't give my real age			
Pearson correlation	1	0.251**	0.154**
Sig. (bilateral)		0.000	0.000
N	2498	2489	2364
When I set up an account I use a fake name			
Pearson correlation	0.251**	1	0.102**
Sig. (bilateral)	0.000		0.000
N	2489	2500	2361
Cyberbullying			
Pearson correlation	0.154**	0.102**	1
Sig. (bilateral)	0.000	0.000	
N	2364	2361	2373

**The correlation is significant at 0.01 (bilateral).

Part 2: Behaviors linked to cyberbullying and the setting up of fake accounts

The study also aimed to determine whether or not there is an association between higher scores in the scale of behaviors linked to cyberbullying and the setting up of social media accounts under a fake name or age (Table 4).

Scores obtained on the cyberbullying behavior scale were found to correlate positively with setting up accounts under a fake name ($r=0.102$), with a significance level of significance=0.000. These same scores also correlated positively ($r=0.154$) and significantly (significance = 0.000) with not stating one's real age when setting up an account. Furthermore, a positive ($r = 0.251$) and statistically significant (significance = 0.000) association was observed between setting up accounts under a fake name and not giving one's true age when registering on a social media site. Nevertheless, despite the stated correlations, these results should be taken with a certain amount of caution, since the correlation values are relatively weak (Dancey and Reidy, 2007).

As mentioned also in the corresponding part of the Discussion below, these findings have serious implications for the design and implementation of educational intervention programs on cyberbullying and digital literacy.

Part 3: Behaviors linked to cyberbullying and the social media

Finally, we also aimed to determine on which social networking sites or instant messaging apps behaviors linked to cyberbullying are most common. To this end, we divided the sample into four groups: (a) those who habitually engage in cyberbullying behaviors on the social media, with a mean score of between 3.001 and 4 (high frequency profile); (b) those who occasionally engage in cyberbullying behaviors on the social media, with

Table 5. The social media used for behaviors linked to cyberbullying.

Site or app	Statistic	Profile			Never (D)	Total
		High (A)	Medium (B)	Low (C)		
Facebook	<i>N</i>	2	15	136	113	266
	%	0.8	5.63	51.12	42.5	100.00
	Accumulated %	0.75	6.38	57.50	100.00	100.00
Twitter	<i>N</i>	0	10	109	118	237
	%	0	4.2	46.0	49.8	100.00
	Accumulated %	0	4.21	50.20	100.00	100.00
Telegram	<i>N</i>	1	2	27	43	73
	%	1.36	2.73	36.98	58.9	100.00
	Accumulated %	1.36	4.09	41.07	100.00	100.00
Whatsapp	<i>N</i>	2	33	501	802	1338
	%	0.14	2.46	37.44	59.94	100.00
	Accumulated %	0.14	2.6	40.04	100	100.00
Instagram	<i>N</i>	3	39	534	637	1213
	%	0.24	3.21	44.02	52.51	100.00
	Accumulated %	0.24	3.45	47.47	100.00	100.00
Snapchat	<i>N</i>	1	18	244	342	605
	%	0.16	2.97	40.33	56.52	100.00
	Accumulated %	0.16	3.13	43.46	100.00	100.00
TikTok	<i>N</i>	1	14	148	263	426
	%	0.23	3.28	34.74	61.73	100.00
	Accumulated %	0.23	3.51	38.25	100.00	100.00
Youtube	<i>N</i>	1	7	50	132	190
	%	0.52	3.68	26.31	69.47	100.00
	Accumulated %	0.52	4.2	30.51	100.00	100.00

a mean score of between 2.001 and 3 (medium frequency profile); (c) those who rarely engage in the actions described in the cyberbullying behavior scale, with means of between 1.001 and 2 (low frequency profile); and finally (d) those who never carry out any of the actions described in the scale, with a mean of 1 (Table 5).

The results of the analysis regarding the social networking sites and instant messaging apps most used by those who have engaged in actions linked to cyberbullying, in any of the three groups (A – high frequency; B – medium frequency; and C – low frequency) clearly shows that Facebook (accumulated %: 57.50) represents the greatest

concentration of children and adolescents in these three groups, followed by Twitter (accumulated %: 50.50) and Instagram (accumulated %: 47.47). In contrast, YouTube and Tik Tok were found to have a higher concentration of people who claim never to have engaged in behaviors linked to cyberbullying.

As explained in the next section, these statistical findings are important, since they point to the responsibility of digital service providers to verify the data provided by users when registering on social networking sites and instant messaging apps.

Discussion

The results presented here indicate that behaviors linked to cyberbullying carried out on social networking sites and instant messaging apps, while limited, nevertheless occur among children and adolescents. As Kowalski et al. (2019) state, there is a large degree of variability in the prevalence of cyberbullying in accordance with factors such as age, gender, the context, and characteristics of the study and the time frame analyzed. Recent meta-studies (Brochado et al., 2017; Camerini et al., 2020) have found that cyberbullying victimization rates are higher than cyberbullying perpetration rates. The results of our study, which focuses on the later aspect (perpetration), are consistent with this general trend and indicate that relatively few children and adolescents claim to engage assiduously in actions linked to cyberbullying on social networking sites or instant messaging apps (e.g. insulting, spreading false rumors, or posting hurtful photographs or videos, etc.).

This is further nuanced by the results obtained in terms of gender and age differences, which indicate that adolescent social media users are mainly older boys who tend also to engage more in cyberbullying behaviors.

Regardless of the prevalence rate, it is important to remember that many authors have drawn attention to the severe repercussions of cyberbullying on victims' lives. For example, cyberbullying has a negative impact on mental health (Kowalski et al., 2014) and has been linked to the onset of a wide variety of problems, including illegal substance abuse, behavioral problems, self-harming behaviors, anxiety and depression, among others (Gini et al., 2018; Kwan et al., 2020). Particularly concerning is the association that exists between cyberbullying and suicide (Hinduja and Patchin, 2019; Kim et al., 2020).

These results point to the need to focus more on the implementation of programs designed to foster constructive conflict resolution and the responsible use of technology, social networking sites, and instant messaging apps (Lareki et al., 2017). Many educational programs have been designed and found to be effective in preventing cyberbullying (Ang, 2015; Smith, 2019), although the approaches implemented vary widely. For example, programs focusing on comprehensive individual and group interventions in the classroom, school, and family (Pérez et al., 2013) have been found to be effective, as have others that seek to foster the development of emotional competencies (Postigo-Zegarra et al., 2019). Furthermore, some authors highlight the importance of promoting social responsibility (Cohen-Almagor, 2018).

Although different authors have corroborated that cyberbullying is indeed a reality during adolescence (Brochado et al., 2017), our study indicates that the peak for this kind of behavior on social networking sites and instant messaging apps occurs at around age

16 years. As stated by Alim (2017), more assiduous use of social media by adolescents has turned cyberbullying into an important problem. However, it is important to bear in mind that the generalized use of social networking sites and instant messaging apps begins at an earlier age, between 13 and 14 years, the minimum age established by many countries and digital service providers for managing data without parental permission (Altuna et al., 2020). Consequently, there is an urgent need to implement cyberbullying prevention programs and promote the responsible use of digital technologies at an earlier age, before adolescents begin to use them assiduously.

Given that in our study we found an association between behaviors linked to cyberbullying and the use of fake online profiles (i.e. setting up accounts under fake names and giving a fake age), these programs should also incorporate content aimed at promoting respect for real digital identities, particularly during the period in which children and young adolescents begin to establish social media profiles. In conjunction with other educational actions designed to highlight the importance of respecting digital profiles throughout adolescence, this measure may be an effective means of reducing the prevalence of cyberbullying. Specific training actions aimed at helping adolescents develop a positive digital identity already exist (Linn et al., 2017), although this type of content is usually included in programs designed to foster digital literacy and a good level of digital competence. In light of our results and those obtained in other recent studies (Adjei et al., 2020), it may also be a good idea to scale up the implementation of these programs and broaden the age range of the target group, with the aim of fostering respect for real digital identities as a means of reducing cyberbullying.

Our results also indicate that cyberbullying behaviors vary across users of the different digital platforms studied. For example, those who engage more assiduously in cyberbullying actions tend more to use Facebook, Twitter, and Instagram, whereas those who engage less assiduously in this kind of behavior tend more to use TubeTube and Tik Tok. The age factor also seems to have a significant effect. According to the results of our study, younger participants engage less in cyberbullying actions, and according to other studies, younger adolescents also tend to use YouTube and Tik Tok more frequently than other social media (Observatorio Vasco de la Juventud, 2019; Pérez, 2020; Xu et al., 2019). Regardless of the reason for these differences, educational interventions should focus specifically on the users of digital sites and apps on which most cases of cyberbullying occur.

Similarly, national and international child protection organizations should exert greater control over all companies that provide digital services to the general population, and to children, adolescents and young people in particular. Companies should be obliged to make a greater effort to detect and deactivate digital service user accounts that do not correspond to real identities, particularly given the fact that the creation of fake profiles is becoming increasingly frequent (Patel et al., 2020). The results of our study indicate that many of these accounts are associated with actions linked to cyberbullying, rather than just publicity or the spreading of fake news.

Stricter control over the veracity of user accounts should be accompanied by greater efforts by virtual service providers to prevent and eradicate behaviors typically associated with cyberbullying carried out on both social networking sites and instant messaging apps. In addition to publicizing information about the problem over the social media,

companies could also implement actions designed to raise awareness of the netiquette rules that should govern all common digital spaces. Similarly, digital service providers should launch campaigns designed to prevent inappropriate behavior and should regularly generate and disseminate messages telling users what to do in the event of witnessing situations of bullying on their websites or applications. This may serve to transfer to the digital environment certain ideas that have widely been proven effective for the design of face-to-face bullying prevention programs (Green et al., 2020; Herkama and Salmivalli, 2018), and which seek to deactivate those who support bullies and provide victims with greater protection.

Finally, we hope that the outcomes of this study may prove useful for improving existing cyberbullying and digital literary intervention programs, as well as for increasing the engagement of digital service providers and encouraging them to generate safer virtual spaces for the users of social networking sites and instant messaging apps.

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