

“Fare male farsi male” project – Are cyberbullying and cyber victimisation associated with physical activity levels? a cross sectional study in a sample of Italian adolescents

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Abstract

Background. The aim of this project is to study the prevalence of cyberbullies (CB) and cybervictims (CV) and cyberbully-victims (CBV) in Italian adolescent students and a possible correlation with physical activity (PA) levels and as potential protective factor.

Methods. The Italian version of the European Cyberbullying Intervention Project Questionnaire (ECIPQ) was used for categorized cyberbullies (CB) and cybervictims (CV). Six items of the IPAQ-A Italian version were considered to measure the PA levels.

Results. 2112 questionnaires were collected, with response rate of 80.5%. The sample reported 9% was CV only, 5% was CB only, and 6% was cyberbully-victims (CBV). The factors that are significant associated to the CV students were: female gender (OR=1.7; 95%CI:1.18-2.35); stay at middle school (OR=1.56; 95%CI:1.01-2.44); spent more than 2 hours on IT devices (OR=1.63; 95%CI:1.08-2.47). The variables significant associated to the CB students were: gender male (OR=0.51 95%CI:0.320-0.80); spent more than 2 hours on IT devices (OR=2.37; 95%CI:1.32-4.26); tobacco use (OR=2.55; 95%CI:1.63-3.98); an inverse proportion with the number of days spent in vigorous physical activities (OR=0.82; 95%CI:0.68-0.98). The CBV students were significant associated with a male gender (OR=0.58; 95%CI:0.38-0.89) and tobacco consumption (OR=2.22; 95%CI:1.46-3.37).

Conclusions. The physical activity at vigorous level seem to be related to less involvement in cyberaggression, so it is recommended that those responsible for training adolescents' favour this aspect. Research on effective prevention is insufficient and evaluation of policy tools for cyberbullying intervention is a nascent research field an any prevention or intervention program could consider this factor. *Clin Ter 2023; 174 (3):296-302 doi: 10.7417/CT.2023.2537*

Key words: Cyberbullying, cyber victims, internet use, bullying, students, adolescence, physical activity

Introduction

In the modern era, the social reality that emerges is rather discouraging: young people have lacked the human relationship, the one defined as true pedagogical communication.

Probably the communication methods implemented by educational agencies have been more prevalent towards the acquisition of scientific knowledge but have neglected the human relationship. The relational dimension appears rather superficial, characterised by indifference and unwillingness to accept the other person in their uniqueness and diversity. The prevalent use of information and communications technologies (ICTs) has significantly transformed interpersonal relationships among adolescents (1). Research has also shown that the use of ICTs has led to an increase in social problems, including cyberbullying (2); a phenomenon currently regarded as a major public health issue in schools (3, 4) given its negative impact on the social and emotional development of children and adolescents (5).

The cyberbullying perpetration is defined as using digital communication tools to insult or threaten someone(6). Another definition is that the cyberbullying perpetration is a violent, deliberate act performed by a group or an individual again and again or over time, via electronic devices, against victims who cannot easily defend themselves (7). Research shows that many adolescent students get involved in cyberbullying. The prevalence of cyberbullying victimisation was reported to range between 10% and 57%(8, 9). An Italian study published in 2018 referred that the proportion of cyber-victimisation was reported by 9.1% of female teens and by 6% of males; while the cyberbullying perpetration was reported by 6.6% of boys and 6.2% of girls, with the highest percentage observed in 13-year-old girls and 15-year-old boys (8.0% and 7.9%, respectively)(9, 10).

A South Korea study reports that 6.3% of students were cyberbullies, 14.6% cyber victims and 13.1% cyberbullying victims (those who perpetrate cyberbullying and are its victims) (11). In another Finland study, 7.4% of students were cyberbullies, 4.8% cyber victims and 5.4% cyberbully victims (12).

Many reasons for the spread of cyberbullying among youth can be speculated on: for example, the large use of smartphone applications, like Social Network Services (SNSs), appears to be the most influential factor in the occurrence of cyberbullying (13, 14).

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Looking at the problem proactively: is it possible to find a condition that reduce the spread of cyberbullying / cybervictimization? Considering that the principles and guidelines underpinning recommender systems as applied to the issue of school bullying is quite unexplored also, it is more true in the cyberbullying too.

The idea at the basis of this research is: Is it possible that physical activities (PA) influence the cyberbullying perpetration? Is there correlation between PA with cyberbullying/cybervictimization? In relation to the enjoyment of physical activity, the relationships with traditional bullying are not fully clarified (15, 16), meaning that these relationships are even more unknown in relation to cyberbullying (16). PA is considered a factor in protecting against cyber-bullying, but the number of studies is still very low (17, 18). Merrill et al. observed that the prevalence of cyberbullying was lower in students who were physically active at least 5 days a week and for 60 min each day compared to those whose weekly physical activity frequency was lower (17). Bertinez-Sillero et al. (18) analysed the relationship between the amount of physical activity practiced, different types of physical activity with cyberbullying by looking at both the profile of cybervictimization and that of cyberaggression. It seems that practising physical activities that involve competition can help to develop defence mechanisms against cyberaggression, as well as improve values to be less involved in cyberaggression.

To our knowledge, few studies have analysed the cyberbullying phenomenon with a national sample. The aim of this work is to study the prevalence of cyberbullies (CB) and cybervictims (CV) and cyberbully-victims (CBV) in Italian adolescent students sample considering a validate tool the European Cyberbullying Intervention Project questionnaire (ECIPQ). Secondly the correlation of the CB and CV with physical activity levels and sociodemographic aspects as potential risk or protective factors.

Methods

A cross-sectional study was performed and the STROBE Statement was followed (19). This study is a part of a project "Fare male Farsi male" conceived by CISCoD (Comitato Italiano Sport Contro Droga), an association of the CONI (Comitato Olimpico Nazionale Italiano - Italian National Olympic Committee) and carried out with its support.

Participants

The overall sample comprised adolescent students of middle and high schools.

Instrument e data collection

Participants completed an anonymous, self-report on-line questionnaire based on the Italian version of the European Cyberbullying Intervention Project Questionnaire (ECIPQ) (20, 21). The questionnaire was translated and validated into five different languages (22), and for this reason, it was chosen among validated tools for the Italian population. ECIPQ comprises 22 items (11 for cyber-victimization and 11 for

cyber-aggression). The ECIPQ uses a Likert-type scale with five response options ranging from 0 = never, 1 = once or twice, 2 = once or twice a month, 3 = about once a week, and 4 = more than one once a week. An example of an item for cyber-victimization is "Someone said nasty things to me or called me names using texts or online messages," while "I spread rumours about someone on the Internet" is an example of a cyber-aggression item. The internal consistency of the original test is optimal: a cyber-victimization = 0.97; a cyber-aggression = 0.93; a total = 0.96.

A second part of the questionnaire included items on the physical activity (PA) level. Six questions were asked to determine the amount and type of physical activity. The first three items were based on the questionnaire of the Italian version of IPAQ-A and modified (23). The questions were as follows:

Physical activity in your free time: Have you done any physical activity moderate in the last 7 days (last week)? If yes, how many days have you done it? How many minutes in one of these days?

Other three analogue questions were asked for the vigorous intensity activities.

Finally, a list of demographic characteristics and habits on tobacco consumption and on the use of information technology (IT) devices were collected. The IT devices included mobile or not devices, such as laptops, smartphones, personal computers (PC), tablets PC.

Definitions

To establish the different roles of involvement, the criteria established by the authors of the ECIPQ scale were used (20). In particular, for calculating the prevalence of cyberbullying, the roles of behaviours participation and repetition were considered. Thus, cyber-victims (CV) have been identified with ECIPQ scores equal or higher than 2 (once a month) in any of the items of cyber-victimization and with scores equal or lower than 1 (once or twice) in all of the items of aggression. In addition, cyber-aggressors (alias cyber-bully, CB) are those subjects with ECIPQ scores equal or higher than 2 (once a month) in any of the items of cyber-aggression and equal or lower than 1 (once or twice) in all of the items of cyber-victimization. Cyberbully/victim (CBV) have been identified those subjects with a ECIPQ score in any of the items of both cyber-aggression and cyber-victimization with a score equal or higher than 2 (once a month).

Procedure

To ensure ethical standards, we first obtained authorization from the school officials and subsequently sent informed consent forms to the students' parents and/or legal guardians. After receiving signed consent from the parents, before performing an education initiative and administering the questionnaire to the students, we informed them that participation was anonymous and voluntary and explained the objective of the study.

A informative intervention in the middle and high school on cyberbullying and cybervictimization was been the opportunity to provide online survey link. This link was

purposed at the end of the meeting. The administration was held from May 2022 to December 2022. The average time taken to complete the questionnaire was mean 15 minutes. Convenience sampling was performed owing to accessibility. The list of the 22 schools involved is shown in the acknowledgements.

Statistical analysis

Analyses were performed using GNU PSPP 1.6.2 statistical software for Windows (24). Descriptive statistics were used to describe the characteristics of the study population.

To compare CV and CB, the differences in continuous variables were tested with t-test and when non-normal using Mann-Whitney test, whereas the differences in proportions were tested with chi-squared tests (χ^2) or Fisher Exact test. The normality of quantitative variables was assessed using Kolmogorov-Smirnov test.

Three Logistic regression models were computed in order to assess the predictors of factors associate with the followed dependent variables: CB, CV and CBV. The covariates included in the models were the variables that at univariate analysis shown a $p < 0.25$, this cut-off value of 0.25 is supported by literature (25, 26). The OR and the confidence interval at 95% (95%CI) were computed. The goodness of fit o the models were tested using the Hosmer and Lemeshow test: small p-values mean that the model is a poor fit; like most goodness of fit tests, these small p-values (usually under 5%) mean that your model is not a good fit(27).

A two-sided $P < 0.05$ was considered statistically significant.

Ethical considerations

The study was conducted in conformity with the Declaration of Helsinki (28). The Italian legislation currently regulates only observational studies on medicinal products, leaving the conduction of other observational studies without a normative reference(29, 30).

Results

A total of 2623 students has been asked to participate in this study. 2112 questionnaires were collected, with response rate of 80.5%. The sociodemographic and smoking characteristics of the sample were: 47% was female, 86% was high school student. The geographical distribution was: 70% was from Latium (Center Italy), 20% from Calabria (South Italy) and 8% from Tuscany (Center Italy).

In the total sample, 9% were cybervictims only, 5% were cyberbullies only, and 6% were cyberbully-victims (Table 1).

Missing values were present in the four items on PA and they ranged between 12% and 18%. In particular, N=349 missing values were reported in the two items concerning moderate PA; N= 251 missing values on vigorous minutes spent of PA per days, N=242 missing values on number of days spent in vigorous PA.

Table 1. Prevalence of cybervictim and aggressors definition adopted according to the ECIPQ.

Variables		N	%
Cyber victims ^a	yes	181	9
	no	1931	91
Cyber bully ^a	yes	114	5
	no	1998	95
Cyber victims/bully ^a	yes	121	6
	no	1991	94

a. definition adopted according to the ECIPQ.

No significant differences were found on data missing by gender, CV, CB and CBV ($p > 0.05$).

Table 2 reported the IT use habits, smoking habits, and extra-school physical activities (n. days and time per day). Concerning the IT devices habits 69% of the students declared to spend more than 2 hours on IT devices and 58% referred to use them alone; 42% referred to have try to smoke at least once and 16% referred to smoke every day at least one cigarette; 1.5 day (SD=2) and about 1 hour (SD=1.32) per day were the mean time spent in vigorous level of physical activities; 1 day (SD=1.7) and 49 minutes (SD=86) per day were the mean time spent in moderate level of physical activities.

The univariate analysis was shown in Table 2. It can be seen that, significant differences in victimisation in girls and who stay at middle school: $p=0.002$ and $p=0.045$ respectively. The aggression in cyberbullying is significant associated with males ($p=0.027$), stay more than 2 hours on ITC device ($p < 0.001$), smoking habits ($p < 0.001$) and play vigorous PA ($p=0.041$). The CBV status was associated with males ($p=0.011$); who spent more than 2 hours on IT devices ($p < 0.001$); tobacco smoking habits ($p=0.001$).

The univariates analysis in Table 2 suggests to add as covariates in the logistic regression models all variables, because the p-values were lower than 0.25. The logistic regression models were shown in Table 3. The factors that are significant associated to the CV students were: female gender (OR=1.7; 95%CI:1.18-2.35); stay at middle school (OR=1.56; 95%CI:1.01-2.44); spent more than 2 hours on IT devices (OR=1.63; 95%CI:1.08-2.47).

The variables significant associated to the CB students were: gender male (OR=0.51; 95%CI:0.320-0.80); spent more than 2 hours on IT devices (OR=2.37; 95%CI:1.32-4.26); tobacco use (OR=2.55; 95%CI:1.63-3.98); an inverse proportion with the number of days spent in vigorous physical activities (OR=0.82; 95%CI:0.68-0.98).

The CBV students were significant associated with a male gender (OR=0.58; 95%CI:0.38-0.89) and tobacco consumption (OR=2.22; 95%CI:1.46-3.37).

Discussion

The sample reported 9% was cybervictims only, 5% was cyberbullies only, and 6% was cyberbully-victims, these values are aligned the literature (9, 10, 12). The findings on cyberbullying victimization are in line with recent Italian literature (10) and they are no so far from the data in other

Table 2. Descriptive and univariate analysis of the cyber-victimization/bullying (CV/CB/CBV) compared with time spent on IT devices / physical activities level.

Qualitative Variables	Total		CV		p ^b	CB		p ^b	CBV		p ^b
	N	%	No (%)	Yes (%)		No (%)	Yes (%)		No (%)	Yes (%)	
Gender	m	1121	53	1045(94)	76(6)	1049(94)	72(6)	1043(93)	78(7)	0.011^c	
	f	992	47	887(89)	105(11)	950(96)	42(4)	985(96)	44(4)		
School level	middle	300	14	266(89)	34(11)	286(96)	11(4)	290(96)	11(4)	0.087 ^c	
	high	1812	86	1665(92)	147(8)	1709(94)	103(6)	1813(94)	110(6)		
How much time do you spent using IT devices for your personal activities? (No school activities)	0	18	1	17(94)	1(6)	17(94)	1(6)	13(72)	5(28)	<0.001	
	<1h	193	9	177(92)	16(8)	190(98)	3(2)	203(98)	5(2)		
	1-2h	449	21	424(94)	25(6)	437(97)	12(3)	456(96)	19(4)		
You are use to using IT devices for your personal activities ...	>2h	1452	69	1313(90)	139(10)	1354(93)	98(7)	1431(94)	94(6)	<0.001	
	with friends	599	28	552(92)	47(8)	560(93)	39(7)	577(93)	46(7)		
	alone	1220	58	1119(92)	101(8)	1154(95)	66(5)	1232(95)	63(5)		
	with family relatives	120	6	103(86)	17(14)	117(97)	3(3)	94(93)	7(7)		
Have you ever smoked tobacco?	other	154	7	139(90)	15(10)	149(97)	5(3)	25(96)	1(4)	0.090	
	I'm not user	19	1	18(95)	1(5)	18(95)	1(5)	17(90)	2(10)		
Have you ever smoked tobacco?	no	1234	42	1133(92)	101(8)	1193(97)	41(3)	1214(96)	52(4)	0.001^c	
	yes	878	58	798(91)	80(9)	805(92)	73(8)	889(93)	71(7)		
Quantitative variables		Mean(SD); median (IQR)	Mean(SD); median (IQR)	Mean(SD); median (IQR)	p ^d	Mean(SD); median (IQR)	Mean(SD); median (IQR)	Mean(SD); median (IQR)	Mean(SD); median (IQR)	p ^d	
	time spent on sports and free time in moderate physical activities	1.1(1.7); 0 (2)	1.1(1.7); 0(2)	1.2(2); 0(2)	0.875	1.1(1.7); 0(2)	0.9(1.7); 0(1)	1.1(1.8); 0(2)	0.8(1.9); 0(2)	0.471	
	time spent on sports and free time in vigorous physical activities	48.8(86.2); 0(60)	48.5(86.0); 0(60)	50.9(89.2); 0(60)	0.954	48.9(85.4); 0(60)	50.0(99.8); 0(60)	49.1(87.1); 0(60)	42.5(69.6); 0(60)	0.718	
	1.5(2); 0(3)	1.5(2.0); 0(3)	1.5(2.1); 0(3)	0.822	1.5(2.0); 0(3)	1.1(1.8); 0(2)	1.5(2.0); 0(3)	1.5(2.0); 0(3)	0.680		
	61.5(92.3); 0(120)	61.8(93.0); 0(120)	58.2(85.8); 0(120)	0.971	61.6(90.9); 0(120)	58.8(113.4); 0(75)	60.8(91.5); 0(120)	71.5(104.6); 0(120)	0.484		

a: at least 10 minutes; b: p-value of chi-square test; c: p-value of Fisher Exact test; d: p-value Mann-Whitney; bold: p<0.05.

Table 3. Three logistic regression models with dependent variables: CB, CV and CBV.

Covariates		CV			CB			CBV		
		OR	IC95%		OR	IC95%		OR	IC95%	
			inf	sup		inf	sup		inf	sup
Gender	male	-			-			-		
	female	1.7	1.18	2.35	0.51	0.32	0.80	0.58	0.38	0.89
School level	high school	-			-			-		
	middle school	1.6	1.01	2.44	0.83	0.37	1.90	0.76	0.35	1.64
2 or more hours spent using informatics devices (PC, smartphone or tables) for personal activities	no	-			-			-		
	yes	1.6	1.1	2.47	2.37	1.32	4.26	1.31	0.81	2.12
You are use to using informatics devices for your personal activities ...	with... ^a	-			-			-		
	alone	0.9	0.60	1.20	0.92	0.59	1.42	0.77	0.51	1.16
Have you ever smoked tobacco?	no	-			-			-		
	yes	1.10	0.77	1.60	2.55	1.63	3.98	2.22	1.46	3.37
time spent on sports and free time in moderate physical activities	N.days	1	0.93	1.13	0.96	0.82	1.13	0.92	0.81	1.05
	N. minutes per day	1	1	1	0.99	0.99	1.01	1.01	0.98	1.01
time spent on sports and free time in vigorous physical activities	N.days	1	0.90	1.20	0.82	0.68	0.98	1.03	0.87	1.22
	N. minutes per day	1	0.98	1.01	1.01	0.99	1.01	1.01	0.99	1.01
Hosmer and Lemeshow's Test		0.509			0.145			0.959		

a: friends/parents/ sisters/ borthers/relatives/other; -: reference group; bold:p<0.05

Countries that established that the prevalence of the adolescent victimization form cyberbullying is 4.8% in Finland, and ranges from 13.99% to 57.5% (9, 12).

The most innovative result found in this study is the fact that the lowest results in cyberaggression were observed in the ones who practice vigorous level of physical activity, although in the regression models it is corrected by gender, school grade, and tobacco consumption. It is in line with the only one study (18) published that applied the same tools to measure the PA and cyberbullying cyberbullying perpetration/ victimization. In particular, the findings were that the practice of PA that improve values to be less involved in cyberaggression.

It is need to consider that the lower involvement of teens practicing physical activities in cyberaggression behaviour could be related to a lower use of the internet in their free time because they practice physical activities instead(18).

The effect of gender on cyberbullying is controversial. This research is in line with the Italian study published by Marengo et al. (10) where the girls reported higher cyber-victimisation than, even if a different definition of CV is used. Other studies found significant association by gender, in particular our findings are in agreement with that boys are more likely to be perpetrators of cyberbullying than are girls(31–33) and that girls are more likely to be targets of cyberbullying than are boys (7, 33–35). Although it must also be mention that other studies, however, indicate no gender effect on cyberbullying perpetration (36, 37).

Concerning the age, according to Morengo et al. the middle school, about 11 and 13-year-old, resulted a risk factor for cyber victimisation (10).

The extent of internet use confirms the literature: the level of involvement in online communication or social activities either through mobile devices or computers seems to be significantly related to cyberbullying (7, 37, 38).

Limitation

The sample was limited to opportunistic middle and high schools students in 2021-2022 and it should be considered in the generalizability of the outcomes.

Also, it can be considered that no details are known about the moments when adolescents suffer or carry out cyberbullying.

There is 18% of missing values in the part of the questionnaire dedicated to PA measures. It could be have a possible impact on the generalizability of the results, though no significant differences were found by gender and cyberbullying perpetration and victimization outcomes. Maybe the items have to be reviewed and it is necessary to evaluate whether they are understandable. On the other hand these items maybe have be to purposed with closed answers considering the disposition of an adolescent setting. A different possible instruments to measure the PA level could be considered in future.

Conclusions

The high level of participation, (80%) represent a success for data collection in order to explore prevalence of CV and CB.

The novelty of the topic and the results collected could be improve the knowledge of the phenomenon of CB and CV in Italian adolescents and, more generally, in the world.

The study indicated that females and were the risk factors for being cyberbully-victim, while spending one hour or less on the internet, no smoking and being female were a protective factor against being cyberbully. Concerning the physical activity at vigorous level seem to be related to less involvement in cyberaggression, so it is recommended that those responsible for training adolescents' favour this aspect. Research on effective prevention is insufficient and evaluation of policy tools for cyberbullying intervention is a nascent research field an any prevention or intervention program could consider these factors.

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