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Associations between cyberbullying victimization and depressive symptoms in early adolescence

Associações entre vitimização por cyberbullying e sintomas de depressão em jovens adolescentes

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ABSTRACT

Objective: To explore distinctive links between specific depressive symptoms (e.g., anhedonia, ineffectiveness, interpersonal problems, negative mood, and negative self-esteem) and cyberbullying victimization (CBV). **Methods**: This cross-sectional study collected data from 268 adolescents between the ages of 13 to 15 years-old (50.7% female) who responded to the Children's Depression Inventory (CDI) and to the Revised Cyberbullying Inventory (RCBI). **Results:** CBV was positively associated with all CDI's domains (anhedonia, ineffectiveness, interpersonal problems, negative mood, and negative self-esteem). Demographics – such as age and gender – were not significant in explaining CBV. However, ineffectiveness (B = .46, p = .04) and negative mood (B = .37, p < .05) significantly predicted CBV. **Conclusion:** This study reports the first Brazilian examination of the links existing between CBV and specific types of depressive symptoms. Data reinforce the negative impact of cyberbullying experiences on youth's mental health, highlighting stronger associations between negative mood and CBV, which could inform more tailored interventions.

KEYWORDS

Adolescent psychiatry, depressive symptoms, cyberbullying, violence.

RESUMO

Objetivo: Explorar as associações diferenciais entre sintomas depressivos específicos (anedonia, ineficácia, problemas interpessoais, humor deprimido e autoestima negativa) e vitimização por *cyberbullying*. **Métodos**: Trata-se de um estudo quantitativo e transversal que coletou dados de 268 adolescentes, com idades entre 13 e 15 anos (50,7% do sexo feminino), que responderam ao Inventário de Depressão Infantil (CDI) e ao Inventário de Cyberbullying revisado. **Resultados:** A vitimização por *cyberbullying* esteve associada positivamente com todos os domínios avaliados pelo CDI (anedonia, ineficácia, problemas interpessoais, humor deprimido e autoestima negativa). Dados demográficos – como idade e sexo – não se mostraram significativos na predição da vitimização por *cyberbullying*. Todavia, ineficácia (B = 0,46, p = 0,04) e humor negativo (B = 0,37, p < 0,05) foram preditores significativos da vitimização por *cyberbullying*. **Conclusão:** O estudo apresenta os primeiros resultados empíricos brasileiros associando a vitimização por *cyberbullying* com sintomas específicos de depressão. Os dados reforçam o impacto negativo das experiências de *cyberbullying* na saúde mental dos jovens, revelando associações mais robustas entre humor deprimido e vitimização por *cyberbullying*, o que pode subsidiar ações de tratamento e prevenção.

PALAVRAS-CHAVE

Psiquiatria do adolescente, sintomas de depressão, *cyberbullying*, violência.

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INTRODUCTION

Cyberbullying (CB) is an intentional, aggressive type of behavior that occur in technology-based interactions. Research on CB has flourished since early 2000's, attempting to identify risk factors associated with CB and use them as evidence to support healthful usage of information and communications technologies (ICT)[1,2]. Data on CB prevalence vary substantially between studies, which can be partly explained by different measures, the time-frame considered, and cut-off scores adopted. Notably, there seems to be higher prevalence of cyberbullying victimization (CBV) rather than cyberbullying perpetration. Possible explanations might include parental attitudes and cultural norms, as well as social desirability bias in self-reporting[3]. In Brazil, a recent study with 669 adolescents indicated that 1.9% were victims of cyberbullying in the past six months; moreover, traditional bullying was associated with CBV[2]. Additionally, an independent association between CBV and depression over and above traditional bullying has been reported[4], which indicates that this type of aggressive behavior has unique features and must be appropriately taken into account by mental health professionals.

Regarding the most established risk factors for CBV, there has been support that depressed individuals – along with traditional bullying victimization – are at greater risk for being victimized[2,5-7]. Interestingly, a meta-analysis reporting on > 400 primary outcomes indicated that offline victimization and internalizing problems – including depression – had stronger effect sizes for becoming a victim of cyberbullying (r's = .42 and .28, p's < .001, respectively)[8]. More recently, a significant effect size of r = .20 was reported linking CBV and depression, based on data including > 33.000 participants[9]. Age is also associated in increasing the odds ratio of becoming a target of cyberbullying, in which CBV is most likely to occur among younger people[7].

Nonetheless, evidence from meta-analytical research failed to provide specific associations between CBV and depressive symptoms. In general, studies report on overall associations with internalizing problems[8] or total scores on measures of depression[9]. The lack of detailed information might compromise the optimal work of mental health professionals, especially those involved in child and adolescent psychiatry. Therefore, the current investigation attempts to explore distinctive links between specific depressive symptoms (e.g., anhedonia, ineffectiveness, interpersonal problems, negative mood, and negative self-esteem) and CBV in early adolescents. It was predicted that higher occurrence of CBV would be linked to elevated levels of self-reported depression[9]. The profile of CB victims include a perception of powerlessness (or inefficacy to defend against cyber bullies)[3], which could then lead to negative mood and problems in one's relationships[5,8]. Hence, another hypothesis stated that negative mood, ineffectiveness and interpersonal problems would predict CBV.

METHODS

Participants, procedures and design

This cross-sectional study collected data from 268 adolescents between the ages of 13 to 15 years-old (M_{age} = 13.4, SD_{age} = .70, 50.7% female), enrolled in public schools (6th to 10th grades) from the Porto Alegre metropolitan region, RS. The majority (92.5%) had an exclusive mobile phone, while 44% reported possessing their own personal computer. Participants lived with their parents and other relatives (98.1%) and 88.3% of participants had siblings (M = 2.04, SD = 2.44).

The research has been approved by a Research Ethics Committee and followed the recommendations of the Declaration of Helsinki. The researchers contacted ten schools which collaborated in previous projects. After obtaining consent from five schools, the aims of the study were presented to students and parental consent forms were delivered for those interested in taking part. Subsequently, data were collected from participants who had a signed consent form (parents/guardians). A team of psychologists was present during data collection, with the intent of clarifying the research goals and questions, as well as to provide emotional support for students if necessary. Questionnaires were filled at the schools using pen and paper (duration: approximately 30 minutes). Sample size was calculated using G*Power. The procedure taking an average effect size (|ρ|) of .24 in two-tailed Pearson's correlations with 95% of power and α = .05 or less yielded a minimum sample size of 206 individuals.

Measures

Children's Depression Inventory[10] (Cronbach's α = .84). This 27-item measure assesses depression in youth, covering the following domains: anhedonia, ineffectiveness, interpersonal problems, negative mood, and negative self-esteem. Participants are asked to rate every item, and responses range from 0 (sometimes) to 2 (very often). A higher score indicates a greater severity of depressive symptoms (total possible score = 54). In this study, the Brazilian version was used[11].

Revised Cyberbullying Inventory[12] (Cronbach's α = .84). The Brazilian adaptation of this instrument assessed participants' involvement with cybervictimization[3]. The cyberbullying victimization subscale contains 14 items. Participants are asked to select the frequency in which they might have been involved with cyber victimization in the past six months using a scale ranging from 0 (never) to

3 (more than 3 times). The total possible score is 42, with higher scores indicating greater involvement[12].

Data analysis

To account for the study's first hypothesis, bivariate correlations were run to inspect the associations between CBV and depressive symptoms. For the second hypothesis, hierarchical regression analyses were performed (method: enter), taking into account demographic variables in the first step (age and gender). In the second step, variables assessing depressive domains were entered. In the regression procedures, the current study reports on the 95% bias-corrected and accelerated (BCa) bootstrap intervals with 10.000 samples.

RESULTS

CBV was positively associated with all CDI's domains (anhedonia, ineffectiveness, interpersonal problems, negative mood, and negative self-esteem; Table 1). Table 2 reports the results from hierarchical linear regression models examining the role of age, gender, and depression in predicting CBV in Brazilian early adolescents. Demographics (Block 1) were not significant in explaining the dependent variable. However, ineffectiveness (B = .46, p = .04) and negative mood (B = .37, $p < .05$) significantly predicted CBV (Block 2).

DISCUSSION

This study reports the first Brazilian examination of the links existing between CBV and specific types of depressive symptoms. In general, data confirmed the first hypothesis and corroborates what has been noted internationally in terms of a positive association between CBV and depression[4,6,8,9]. However, results indicated differential associations for some depressive traits in comparison to others, which might add to the current understanding associating CBV to one's deteriorated mental health[2,13,14].

Table 1. Correlations between cyberbullying victimization and depression

		1	2	3	4	5	6	7
1. Cyberbullying victimization	Pearson's r	–						
	p-value							
2. Anhedonia	Pearson's r	**.29**	-					
	p-value	**< .001**	-					
	Upper 95% CI	.39	-					
	Lower 95% CI	.17	-					
3. Ineffectiveness	Pearson's r	**.28**	.50	-				
	p-value	**< .001**	< .001	-				
	Upper 95% CI	.38	.59	-				
	Lower 95% CI	.16	.41	-				
4. Interpersonal problems	Pearson's r	**.26**	.45	.47	-			
	p-value	**< .001**	< .001	< .001	-			
	Upper 95% CI	.37	.54	.56	-			
	Lower 95% CI	.14	.34	.37	-			
5. Negative mood	Pearson's r	**.31**	.54	.52	.49	-		
	p-value	**< .001**	< .001	< .001	< .001	-		
	Upper 95% CI	.41	.62	.61	.58	-		
	Lower 95% CI	.19	.45	.43	.39	-		
6. Negative self-esteem	Pearson's r	**.14**	.45	.61	.39	.50	-	
	p-value	**.02**	< .001	< .001	< .001	< .001	-	
	Upper 95% CI	.26	.54	.68	.48	.59	-	
	Lower 95% CI	.02	.35	.52	.28	.40	-	
7. Depression (total)	Pearson's r	**.33**	.82	.76	.70	.81	.73	-
	p-value	**< .001**	< .001	< .001	< .001	< .001	< .001	-
	Upper 95% CI	.44	.85	.81	.75	.85	.78	-
	Lower 95% CI	.21	.77	.71	.63	.76	.67	-

Note. In bold, significant correlations between cyberbullying victimization and depression are highlighted.

Table 2. Hierarchical linear regression examining the role of age, gender, and depression in predicting cyberbullying victimization in Brazilian early adolescents

	B	SE	p	95% BCa CI	R^2_{Adj}
Block 1					
Age	.51	.36	.16	- .18, 1.23	
Gender	- .10	.50	.84	-1.1, .87	
Fit statistics	$F_{(2,242)} = 1.1$, $p = .33$				.001
Block 2					
Age	.38	.33	.26	- .6, 1.01	
Gender	-.58	.46	.22	- 1.45, .37	
Anhedonia	.21	.15	.17	- .07, .50	
Ineffectiveness	**.46**	**.22**	**.037**	.05, .88	
Interpersonal problems	.16	.26	.51	- .35, .66	
Negative mood	**.37**	**.18**	**.047**	.02, .75	
Negative self-esteem	-.34	.20	.08	- .71, .06	
Fit statistics	$F_{(7,237)} = 5.86$, $p < .001$				.12

Notes. In bold, significant predictors are highlighted. BCa CI: Bias-corrected and accelerated confidence intervals; Durbin Watson = 1.87; Variance Inflation Factor range = 1.002 to 1.931.

First, the relationship between depression total scores with CBV depicted in Table 1 was higher in comparison with previous investigations conducted in developed countries (e.g., Australia and Austria; $r = .18$)[4]. At glance, this could suggest that Brazilian youth are perhaps experiencing stronger consequences related to CBV. However, scales used between studies varied. Wang and collaborators[14] reported adopting the Center for Epidemiologic Studies Depression Scale, while Perren and collaborators[4] included different measures for depression in their study. Nonetheless, scholars have emphasized that cultural mechanisms might be closely implicated in cyberbullying behaviors, with reports indicating that social norms could facilitate the occurrence of ICT-mediated aggression[4,9]. Moreover, cultural fluctuations in parental attitudes in relation to youth ICT usage could predispose certain individuals to greater risks for cyberbullying involvement[3]. Thus, differences between studies could reflect particularities seen in the Brazilian context.

Another hypothesis stated that negative mood, ineffectiveness, and interpersonal problems would predict CBV. This hypothesis was partly confirmed. The significant role of negative mood and ineffectiveness in predicting CBV deserve further consideration, especially when prevention and intervention strategies are to be designed. Qualitative data suggested that CBV could cause stronger negative feelings, fear, and helplessness[15], and the current study added empirical support to these associations. Importantly, the fact that ineffectiveness was significant – along with negative mood – in the regression analyses stresses the importance of cognitive-behavioral strategies in targeting CBV, such as emotion-regulation and problem-solving. The associations between CBV with ineffectiveness and negative mood reinforce that imbalance of power is a major criterion in cyberbullying research and could explain the dynamics seen in CBV[16]. Indeed, Menesini and collaborators reported on data from > 2.000 European adolescents who were asked to judge the relevance of terms associated with cyberbullying (i.e., anonymity, imbalance of power, intentionality, public versus private, and repetition). A two-dimensional solution involving imbalance of power and intentionality explained 96% of the variance[16], suggesting that, as seen in traditional bullying[3,5], cyberbullying victims relate imbalance of power with negative mood and ineffectiveness. Therefore, both inefficacy and depression might be associated with youth's lack of power against cyberbullying perpetrators.

Beyond the study's immediate goals, there are some noteworthy implications for understanding youth mental health in the national context. Remarkably, levels of depression were below the international cut-off scores[10], yet very similar to previous report from Brazilian adolescents[13]. This suggests a pattern of stability in these symptoms across studies. Moreover, compared to reports that have used the RCBI to measure cyberbullying occurrence, means for CBV were about half the value reported in developed countries, such as the United Kingdom[5]. Investigations examining possible explanations for these discrepancies between countries are needed, as well as efforts in exploring other psychiatric outcomes associated with CBV. In addition, the limitations of this study must be considered, mainly in relation to self-reported measures and the cross-sectional design. While the former carries the risk of eliciting socially desirable responses, the latter impedes the comprehension of clear cause and effect patterns.

CONCLUSION

This investigation showed that ineffectiveness and negative mood were significant in predicting cyberbullying victimization in early adolescents. The results reported might support future studies on the efficacy of interventions and prevention programs for CBV, both at individual and group levels.

INDIVIDUAL CONTRIBUTIONS

The author has contributed in the study's conception and design, data acquisition, analysis, interpretation of results, writing and approval of the final version.

CONFLICT OF INTEREST

The author has no conflict of interest to report.

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