International Journal of Clinical and Health Psychology (2020) **20,** 135–139

International Journal of Clinical and Health Psychology

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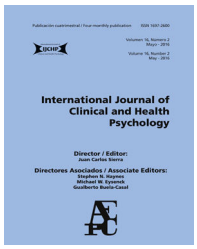

Cyberbullying victimization and somatic complaints: A prospective examination of cognitive emotion regulation strategies as mediators

Lourdes Rey[a,*], **Felix Neto**[b], **Natalio Extremera**[a]

[a] *University of Malaga, Spain*
[b] *University of Porto, Portugal*

Received 13 December 2019; received in revised form 16 March 2020; accepted 17 March 2020
Available online 20 May 2020

KEYWORDS
Cyberbullying;
Cognitive emotion regulation strategies;
Somatic complaints;
Physical health;
Ex post facto study.

Abstract *Background/Objective*: The main purpose of this study was to examine the relationships among cybervictimization, maladaptive cognitive emotion regulation strategies and somatic complaints in a 4-month follow-up study. *Method*: A total of 1,024 high school students (456 male and 568 female, *M* (*SD*) = 13.69 years (1.3 years), range 12–18 years, voluntarily participated in this study. Measures of cybervictimization and cognitive strategies were obtained at Time 1. Four months later (Time 2), measures of somatic complaints were obtained. *Results*: Multiple mediation analyses were conducted to determine the mediating roles of maladaptive strategies in the link between cybervictimization and somatic complaints. As expected, path-analytic results showed that cybervictimization predicted somatic symptoms. Furthermore, some maladaptive regulation strategies, namely self-blame and rumination, partially mediated the link between cybervictimization and somatic symptoms evaluated 4-months later. *Conclusions*: The findings are discussed in terms of the role that maladaptive cognitive emotion regulation strategies might play with regards to physical health in cyberbullying episodes. In general, these findings have important implications for developing an understanding about the affective determinants of somatic health problem initiation and maintenance after a victimization and for developing intervention programs specifically for cybervictimized adolescents.

* Corresponding author at: Faculty of Psychology, University of Malaga, Campus de Teatinos, s/n, 29071 Málaga, Spain.
E-mail address: lrey@uma.es (L. Rey).

https://doi.org/10.1016/j.ijchp.2020.03.003

PALABRAS CLAVE
Ciberacoso;
Estrategias de regulación cognitivo emocional;
Quejas somáticas;
Salud física;
Estudio ex post facto de tipo prospectivo.

Cibervictimización y quejas somáticas: examen prospectivo de las estrategias de regulación cognitivo-emocional como mediadores

Resumen *Antecedentes/Objetivo*: El objetivo fue examinar la relación entre cibervictimización, estrategias de regulación cognitiva emocional desadaptativas y quejas somáticas en un estudio prospectivo a cuatro meses. *Método*: Un total de 1.024 estudiantes de Instituto (456 varones y 568 mujeres, *M (SD)* = 13,69 años (1,3) de 12 a 18 años de edad participaron voluntariamente. En el Tiempo 1, se pasaron los cuestionarios de cibervictimización y estrategias de regulación cognitivo emocional. Cuatro meses después (Tiempo 2), se obtuvo una medida de quejas somáticas. *Resultados*: Se realizaron análisis de mediación múltiple para determinar el papel mediador de las estrategias de regulación desadaptativas en la relación entre cibervictimización y quejas somáticas. Como se esperaba, los resultados indicaron que la cibervictimización predice las quejas somáticas y que algunas estrategias de regulación desadaptativas, autoculpa y rumiación, median parcialmente la relación entre cibervictimización y quejas somáticas evaluadas cuatro meses más tarde. *Conclusiones*: Se discute el papel que juegan las estrategias de regulación desadaptativas sobre la salud física en los episodios de ciberacoso. En general, estos hallazgos sugieren importantes implicaciones para una mejor comprensión de los determinantes afectivos que inciden en el inicio y mantenimiento de problemas somáticos después de una victimización, y para desarrollar programas de intervención específicamente en casos de adolescentes cibervictimizados.

Cyberbullying is an alarming social problem that has gained increased attention from researchers given its serious consequences on victims' mental and physical health (Tsaousis, 2016). In general, cyberbullying is defined as repeated aggressive and hostile messages by individuals or groups sent through the use of electronic media against a victim who cannot easily defend him- or herself. It involves harassing, intimidating, threatening or otherwise harming others by sending or posting threatening or humiliating texts, pictures or videos over the Internet without permission (Patchin & Hinduja, 2010; Tokunaga, 2010).

Victims of cyberbullying typically report low levels of psychological well-being and social maladjustment such as emotion regulation problems, isolation, low self-esteem and suicide (Ak, Özdemir, & Kuzucu, 2015; Extremera, Quintana-Orts, Mérida-López, & Rey, 2018) and more adverse physical health symptoms such as sleep problems, irritability, tension and fatigue than their non- cybervictimized peers (Kowalski & Limber, 2013). While the impact of cybervictimization on mental health have widely studied and well established (Fisher, Gardella, & Teurbe-Tolon, 2016), less is known about its consequences on the physical health of adolescents. The scientific literature has highlighted that one of the factors that plays an important role in the development and maintenance of physical disease is the experience of trauma (Afari et al., 2014). Numerous findings suggest that being cybervictimized is a traumatic experience that might cause somatic symptoms, such as sleep problems, irritability, tension and fatigue, among others (Kowalski & Limber, 2013). Therefore, in order to design effective interventions, it is important to analyse the underlying casual mechanisms.

Several studies have revealed that how people cope and manage a stressful event, such as cybervictimization, plays a crucial role for developing and maintaining somatic complaints. The regulation of negative emotions associated with stressful experiences is a complex process and may involve different strategies. Garnefski, Kraaij, & Spinhoven, (2001) defined nine cognitive emotion regulation strategies as conscious and mental processes that people use to handle the emotionally arousing information. These authors have shown that the cognitive coping strategies might be split up into two separate strategy types, i.e. the theoretically 'more adaptive' strategies (i.e., positive refocusing, positive reappraisal, putting into perspective, refocus on planning and acceptance) and the theoretically 'less adaptive' strategies (i.e., rumination, self-blame, blaming others and catastrophizing). Previous studies have demonstrated that persons who engage in extensive maladaptive coping strategies about negative events are likely to be more vulnerable to emotional problems and somatic complaints than persons who use these strategies less often or use more adaptive strategies (Garnefski, van Rood, de Roos, & Kraaij, 2017). These studies thus suggest that the use of maladaptive coping strategies plays a role in the development of stress related symptoms (i.e., somatic complaints) after a negative event. Thus, research suggests that the type of life event influences the use of specific cognitive emotion regulation strategies (Stikkelbroek, Bodden, Kleinjan, Reijnders, & van Baar, 2016). However, no previous studies have examined the specific maladaptive strategies underlying the cybervictimization-somatic complaints link. Therefore, the present prospective study aimed to examine which maladaptive cognitive strategies mediate the relationship between a specific traumatic life event (to be cybervictimized) and somatic complaints 4 months later. Based on the available evidence on the significant associations between traumatic

life events and somatic complaints along with the fundamental role of coping in health and well-being, we hypothesised that cybervictimization would be significantly and negatively correlated with somatic complaints 4 months later. Furthermore, we expected that maladaptive cognitive emotion regulation strategies might be mediators in the relation between cybervictimization and somatic complaints.

Method

Participants

The sample comprised 1,317 Spanish adolescents (53.5% female) from five high schools in Southern Spain. A total of 1,223 adolescents participated at Time point 1 (T1). Of those 1,223 participants, 1,024 adolescents completed questionnaires at both times (83.7% of the total sample). At T1, adolescents completed the cybervictimization and maladaptive cognitive emotion regulation scales. The somatic complaints questionnaire was administered at time-point 2 (T2) 4 months later. Adolescents who did not complete surveys at both times were dropped from further analyses. Attrition cases were most likely due to student absence at the time of survey administration.

Procedure

The data collection was conducted in classrooms during a 1-h lesson in the winter of the 2019 school year (T1; January) and 4 months later (T2; May). Questionnaires came from a larger project on well-being in adolescents and took approximately 20 min to complete. One questionnaire collected sociodemographic data, provided a nick for the identification of adolescents in T1 and T2 and described the purpose of the study. The instructions for completion were given in classrooms with guarantees of the participants' voluntariness and anonymity. In accordance with the ethical principles for psychological research involving minors, parental written consent was obtained. Approval to conduct this study was obtained from the Research Ethics Committee of the University of Málaga (62-2016-H).

Instruments

The Cognitive Emotion Regulation Questionnaire (CERQ; Garnefski & Kraaij, 2007). This questionnaire comprises 36 items that evaluate nine cognitive strategies evaluated on a 5-point Likert scale. The Spanish version for adolescents, the CERQ-SA (Chamizo-Nieto, Rey, & Sánchez-Álvarez, 2020) was used with adequate reliability and validity (alpha indexes subscales ranged from .62 to .83; omega coefficient = .96). In this study, only the four maladaptive cognitive emotion regulation strategies were assessed: Self-blame, Rumination, Catastrophising and Other-blame.

The European Cyberbullying Intervention Project Questionnaire (ECIP-Q; Brighi, Guarini, Melotti, Galli, & Genta, 2012). The ECIP-Q is a self-report measure that has 22 items covering cyberbullying (cybervictimization and cyberabuse) in the 2 months prior to participation in the survey. The Spanish version by Ortega-Ruiz, Del Rey, and Casas (2016) was used and adequate reliability and validity have been reported (alpha indexes were Cybervictimization = .80 and Cyberabuse = .88).

The Somatic Complaints List (SCL; Jellesma, Rieffe, & Terwogt, 2007). This scale assessed the frequency with which children experience certain somatic complaints and comprise 11 items on a 3-point Likert scale. The Spanish version by Rieffe, Villanueva, Adrián, and Górriz (2009) was used with adequate reliability and validity (Cronbach alpha = .78).

Data analyses

Statistical analyses were conducted with the Statistical Package for the Social Sciences (SPSS) 24 and the macro Process version 3.1. (www.processmacro.org/index.html). To assess associations between the measured variables, Pearson correlation analyses were conducted. In order to examine the signification of indirect or mediated effects of cognitive emotion regulation strategies in the relationship between cybervictimization and somatic complaints, we used the multiple mediation procedure described by Hayes (2017). This method allows for the joint exploration of several estimated indirect effect (e.g., mediated) in a model (through the pathway of each mediator variable, M) and the direct effect of the independent variable (IV) on the dependent variable (DV) using bootstrapping with 5000 re-samples. This bootstrapping approach yields a 95% bias-corrected confidence interval (CI). If the upper and lower limits 95% interval do not contain zero, the indirect effect (mediation) is statistically significant. The numeric values (direct and indirect effects) represent unstandardized coefficients. To avoid potential confounders in the hypothesised relationships, we controlled for age and gender as covariates.

Results

Descriptive statistics, reliabilities and Pearson correlation of all study measures are presented in Table 1.

Regarding multiple mediation, Fig. 1 presents the data for the multiple mediator analysis; it indicates the path coefficients and confidence intervals for each effect being tested in the model. Both covariates (age and gender) effects were significant on somatics complaints (for age $c = .02$, $p < .01$; for gender $c = .14$, $p < .01$). Bootstrap estimation showed that the total effect of victimization on somatic complaints was significant ($c = .03$, $p < .01$), and the effect was still significant when variance associated with the hypothesised mediators was controlled ($c' = .02$, $p < .01$). Of the four indirect effects, two were significant. The effect of cybervictimisation on somatic complaints was mediated by self-blame (indirect effect = .001; 95% CI = .000–.002) and catastrophising (indirect effect = .002; 95% CI = .000–.003). These mediators only partially accounted for the relationship between cybervictmization and somatic complaints, given that the direct effect (c') was statistically significant in this analysis. All together, the multiple mediator model was significant, accounting for 20% of the variance in somatic complaints (R^2 adj = .20; F (7, 992) = 35.39; $p < .01$) (indirect total effect = .003 CI = .001–.005).

Table 1 Means (*M*), Standard Deviations (*SD*), Cronbach's alpha and Intercorrelations among measures.

Variables	1	2	3	4	5	6
1. Cybervictimisation	–					
2. Self-Blame	.10**	–				
3. Rumination	.14**	.52**	–			
4. Catastrophizing	.16**	.35**	.45**	–		
5. Other-Blame	.13**	.09**	.17**	.34**	–	
6. Somatic Complaints	.31**	.21**	.24**	.23**	.06*	–
M	2.54	2.76	3.17	2.51	2.15	1.47
SD	4.10	0.81	0.93	0.90	0.82	0.38
Alpha	.83	.61	.70	.66	.72	.83

Note. *$p < .05$; **$p < .01$.

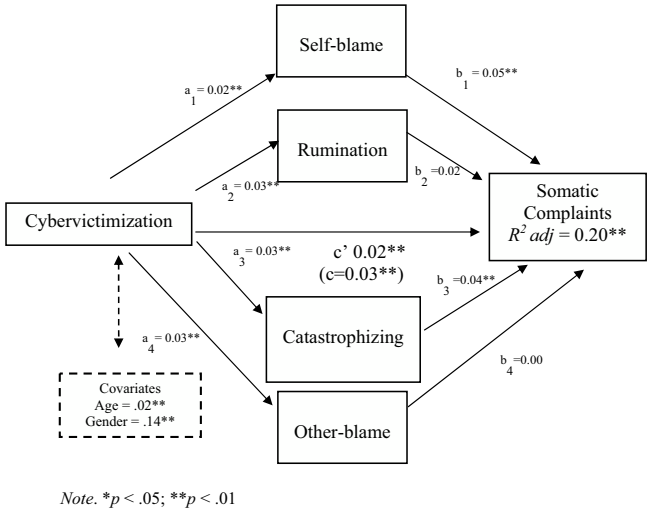

Fig. 1 Multiple mediation model for the effect of cybervictimization on somatic symptoms via maladaptive cognitive emotion regulation strategies controlling for age and gender as covariates. Total effect (*c*-path) is given in parentheses.

Discussion

This prospective study examined the mediating role of maladaptive cognitive emotion regulation strategies on the relationship between cybervictimization and somatic complaints measured in a 4-month period in a relativity wide sample of Spanish adolescents. Prior studies reported the negative consequences of being cybervictimized on mental and physical health indicators (Tsaousis, 2016). Consistently, our results demonstrated that cybervictimisation was prospectively associated with higher somatic complaints in adolescents. Thus, our findings partly supported that some maladaptive cognitive emotion strategies were particularly prominent as mediators, namely self-blame and catastrophising. In sum, cybervictimized adolescents who tended to put the blame for what happened on themselves and emphasised the negative aspects of the cyberbullying were more prone to report somatic complaints 4 month later. These results appear to complement and extend prior research linking self-blame and catastrophising to lower physical health (Garnefski et al., 2017). This finding suggests that when adolescents are cybervictimized, these maladaptive strategies contribute to the experience of elevated somatic health problems.

With respect to clinical implications, our findings provide novel evidences supporting that cybervictimisation might lead to increased somatic symptoms through maladaptive strategies. Based on our results, adolescents who are more likely to use ineffective coping strategies when they are cybervictimised might, therefore, rely on these maladaptive strategies to try to reduce their negative feelings and overwhelming emotions which, in turn, would increase the negative consequences for their physical health. Accordingly, it might be particularly useful to design school prevention programs in adolescents targeting risk reduction of bullying and victimisation and increase of health-related quality of life encouraging adolescents to modify maladaptive patterns of cognitive coping to handle existing bullying and cyberbullying situations. Furthermore, practitioners can assist adolescent victims to recognise the maladaptive coping patterns that they typically use to downplay/disregard their mood states and supply more adaptive strategies on how to handle the cyberaggression behaviours in the future and/or to diminish the negative symptoms for health associated to cyberagression episodes (Divecha & Brackett, 2019).

The present study has some limitations. First, although the main strength of this study was its 4-month prospective design, this time frame does not capture long-term effects. Therefore, a longer-term prospective study design (i.e. at least 6 months or more) would help to clarify how a maladaptive coping pattern exert a lasting effect on health-related quality of life among cybervictimized adolescents. Second, our design was incidental and evaluated healthy adolescents who voluntarily participated in the study. It would be interesting replicate our findings with sample of adolescents with clinical illness (e.g., overweight or obesity) in which other potential mediators might be underlying the link between cybervictimization and health (García-Hermoso, Oriol-Granado, Correa-Bautista, & Ramírez-Vélez 2019; Hormazábal-Aguayo et al., 2019). Third, all findings were based on self-reports. Therefore, long-term prospective randomly designed studies that use structured interview or medical examination in an adolescent clinical sample will be a benefit to future research endeavours.

Despite its limitations, this study underscores the deleterious consequences of being cybervictimized for physical health among adolescents and points towards the potential role of specific maladaptive strategies in the relationship

between cybervictimization and somatic complaints. Future research should therefore investigate whether emotion-regulation skill training to reduce a maladaptive coping pattern might be useful for decreasing physical and somatic problems typically associated with cybervictimization in adolescents.

Acknowledgements

We acknowledge support by University of Málaga (PPIT.UMA.B1.2017/23), PAIDI Group CTS-1048 (Junta de Andalucía) and Junta de Andalucia/FEDER funds (UMA18-FEDERJA-147).

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