Initial assessment of attitudes towards reporting cyber-harassment in children and adolescents

Evaluación inicial de las actitudes hacia el reporte de casos de ciberacoso en niños/niñas y adolescentes

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Abstract

This study aimed to validate the initial scale of attitudes toward reporting cyber-harassment in children-adolescents among people from the Colombian general community. An instrumental study was developed, which was reached in two non-probabilistic samples (n^1 = 220, n^2 = 204). With the first one, a Robust Exploratory Factor Analysis (EFA) was performed, finding a unidimensional 7-item solution (RMSEA = .07, SRMR = .05, CFI = .99, and TLI = .99). A Confirmatory Factor Analysis was conducted in the second sample, finding an optimal fit (RMSEA = .03, SRMR = .04, CFI = .96, TLI = .95). In both models, optimal reliability indices were obtained. The total score was crossed with socio-demographics, finding some real significant difference. Software Factor and *R* with different packages were used.

Keywords: *Colombia, cyber-harassment, psychometrics, attitudes, factor-analysis*

Resumen

Este estudio tuvo como objetivo validar la escala inicial de actitudes hacia la denuncia del ciberacoso en niños-adolescentes entre personas de la comunidad general colombiana. Se desarrolló un estudio instrumental, el cual se alcanzó en dos muestras no probabilísticas (n^1 = 220, n^2 = 204). Con la primera se realizó un Análisis Factorial Exploratorio Robusto (AFE), encontrando una solución unidimensional de 7 ítems (RMSEA = .07, SRMR = .05, CFI = .99 y TLI = .99). En la segunda muestra, se realizó un Análisis Factorial Confirmatorio, encontrando un ajuste óptimo (RMSEA = .03, SRMR = .04, CFI = .96, TLI = .95). En ambos modelos se obtuvieron índices de confiabilidad óptimos. La puntuación total se cruzó con la sociodemográfica, encontrando alguna diferencia significativa real. Se utilizó el software Factor y *R* con diferentes paquetes.

Palabras clave: *Colombia, ciber-acoso, psicometría, actitudes, análisis-factorial*

Introduction

Digital development has allowed the advancement of different Information and Communication Technologies (ICT). However, there is a great concern about the new risks derived from their use, such as cyber-attacks, in which children and adolescents are more likely to be victims (Ayub & Malik, 2020; Beran et al., 2012; Cuenca-Pinqueras et al., 2020; Foley et al., 2015; Hassan et al., 2020; Jagayat & Choma, 2021; Tokunaga, 2010; van Laer, 2014). Cyber-harassment has been defined as an intentional and repetitive aggression in digital environments, characterized by the absence of geographical and temporal limits, where the victim finds it difficult to give a direct response to the aggressor (Ayub & Malik, 2020; Bégin, 2018; Foley et al., 2015; Neelam, 2017; Redondo-Pacheco et al. 2018; Zweig et al., 2013). The primary expressions of this phenomenon are:

1. Cyber-harassment with sexual connotations: It involves the "grooming" practice, in which an adult pretends to be a child or adolescent to establish a friendship in order to get the victim to send photographic material of a sexual nature (Panizo-Galence, 2011). It may involve disseminating sexual material without consent (Bégin, 2018; Cuenca-Pinqueras et al., 2020; Willard, 2007).

2. Doxing: Information is requested from someone and then disseminated without permission (Willard, 2007). It also encompasses spreading embarrassing photos, rumors, and false or harmful information about a person (Beran et al., 2012; Cowie, 2013).

3. Identity theft: A person appropriates another person's identity in digital media, which in some cases involves hacking into the victim's social networks (Baker et al., 2013).

4. Cyber-stalking: Repeatedly, a person seeks to establish contact with another without their consent (Jagavat & Choma, 2021). It involves monitoring and controlling a person's actions through social networks or other technological means without authorization (Cava et al., 2020; Zweig et al., 2013).

5. Cyber-violence: A digital violence can be seen in couple relationships (Cava & Buelga, 2018; Rodríguez-Domínguez et al., 2020), which involves manipulation, excess control, verbal, emotional or social abuse (Neelam, 2017).

6. Cyberbullying: An expression of cyber harassment between peers from the same school context (Neelam, 2017; Foley et al., 2015). It may involve making fun of the sexual orientation, race, religion or ethnic origin of another person through technological means (Rivadulla-López, & Rodríguez-Correa, 2019; Bégin, 2018); the "flaming" practice (online fights between the victim(s) and perpetrator(s)) (Willard, 2007), and the exclusion from different social networks (Cowie, 2013; Rincón-Rueda & Ávila-Díaz, 2014; Lee & Wu, 2018; Willard, 2007).

It has been found that victims of this kind of aggression tend to have adverse effects related to their mental health, like feelings of vulnerability, anger, sadness, shame, guilt, worry, fear and stress (Hassan et al., 2020; Choja & Nelson, 2016; Lu et al., 2018). Alternatively, these people could even show psychopathological symptoms related to depression and anxiety spectrums involving suicidal ideation (Cowie, 2013; Hassan et al., 2020; Hinduja & Patchin, 2010; Walker et al., 2011).

Regarding this situation, the victims are expected to report the aggression themselves (Ayub & Malik, 2020; Beran et al., 2012; Pereira et al., 2016). However, they face some difficulties in closing their cases, since they are asked to show evidence demonstrating the harassment and the whereabouts of the aggressor, elements which the victims do not always have (Halder & Jaishankar, 2011). In other cases, especially children and ad-

olescents tend to refrain from reporting their cases themselves (Hassan et al., 2020), commenting on the situation to someone they trust who may not be their parents (Kahn & Roshan, 2020; Neelam, 2017; Pereira et al., 2016; Wick et al., 2020).

Any of the cyber-harassment manifestations occur in the presence of unlimited third-party observers (Garaigordobil & Aliri, 2013; Lee & Wu, 2018), paradoxically, the report incidence is underreported regarding the general community (Carter, 2013). In the literature, it has been a questioned about the psychological aspects that may involve the   reporting of this type of aggression, taking into account that it is not suitable to assess directly the assessment of "intentions" of the general community to report this type of situation due to the influence of social desirability (Krumpal, 2013; van der Schyff et al., 2022). Because of this, some authors have highlighted the role of attitudes, which influence an individual's intentions in reporting harassment events (Foster & Fullagar, 2018). Traditionally, attitudes have been defined as psychological tendencies, manifested by the evaluations of a particular entity with any degree of favor or disfavor, which brings together other constructs relating to cognition, emotion and behavior (Eagly & Chaiken, 2007; Rosenberg, 1956; Rosenberg, 1960; Ostrom, 1969).

In the literature, no study was found which assesses this same construct, as the case of Walsh et al.'s study (2010), which assessed the teachers' attitudes towards reporting cases of sexual abuse in children; and the study of Cesario et al. (2018), in which Sexual Harassment Reporting Attitudes were evaluated. Furthermore, the studies of Barlett et al. (2016) developed an attitude scale towards cyberbullying, and Gomes-Cavalcanti et al. (2021) validated this scale in Brazil. Other questionnaires concerning cyber-aggression have been validated through studies in other Latin American countries (e.g. Best et al., 2021).

In Colombia, for example, a prevalence of 30% of cyber-harassment in children and adolescents has been recognized (Redondo-Pacheco et al. 2018). However, it was not found any study that has measured attitudes toward reporting cyber-harassment cases. This country has been allied with other Latin-American countries related to the first Safe Internet Center in Latin America. This center has the skills and experience to protect, prevent, help and guide children, adolescents and young people on their journey through the Internet. It has the support of *Te Protejo*, *Red PaPaz,* and *INHOPE* (RedPaPaz, 2023. Viguías. https://viguias.org). Through this center, cases of children or adolescents who have experienced cyber-harassment can be reported.

This study was set to establish an initial instrument to assess attitudes towards reporting cases of cyber-harassment in children and adolescents directed to the Colombian general community. Once reached, it was aimed to confirm this structure and establish possible significant differences between any socio-demographic variable.

Method

An instrumental study was conducted between March 2021 and June 2021. A sequential, non-probabilistic sample was obtained involving Colombian participants. The sample size for the first validation study followed parameters for conducting Classic Theory Test analysis (CTT) and multivariate reduction analysis, defining at least 200 participants (Ferrando et al., 2022; Izquierdo et al., 2014; Osborne & Costello, 2004). For the confirmatory phase of the study, the sample size was estimated by the ratio 1:20 for conducting structural equation modeling analysis (Kline, 2011).

All participants were contacted via social media, and all of them gave their consent to par-

ticipate in the study, as one of the inclusion criteria for taking into account was the fact of being more than 18 years old and having access to technological devices with the internet.

Instrument development

The guidelines proposed by Muñiz & Fonseca-Pedrero (2019) were followed, under which a search of specialized literature was initiated. Once the theoretical framework was consolidated, 34 unidimensional items with a 5-point Likert scale (1 = *Totally disagree*, 2 = *Disagree*, 3 = *Not Agree neither Disagree*, 4 = *Agree*, 5 = *Totally agree*) were created. In order to obtain a content validity evidence that could show the items' representativeness (Muñiz, 1998; Roebianto et al., 2023), the scale was revised by eight judges (with expertise in psychometrics, developmental psychology, and cyber-psychology), who followed the recommendations by Skjong & Wentworth (2000). All of them evaluated items from 1 to 4, considering the criteria of relevance (the degree to which the items assess the content proposed), coherence (the logical relationship between items and construct) and clarity (content precision).

After obtaining the degree of agreement between judges, an Exploratory Factor Analysis (EFA) was performed to establish a preliminary test version. Then, a Confirmatory Factor Analysis (CFA) was performed to confirm the resulting structure. With these results, the socio-demographic variables were crossed to seek potential significant differences in the construct measured.

Data analysis

The degree of agreement was estimated using the Content Validity Index (CVI) proposed by Lawshee (1975). Previous to the EFA, a descriptive analysis was conducted, and items with kurtosis and skewness superior to the absolute value of 7 and 2, respectively, were excluded from the analysis for having extremely abnormal behavior (Fabrigar et al., 1999; Ferguson & Cox, 1993). In addition, the Homogeneity Index (HI) was calculated, and the Measure of Sampling Adequacy (MSA) values below .35 and .70 were set as cutoff criteria to exclude items (Blum et al., 2013; Lorenzo-Seva & Ferrando, 2021). Furthermore, the polychoric Kaiser-Meyer-Oklin (KMO) sampling adequacy test and Bartlett's sphericity test were obtained to establish the accuracy of data to perform an EFA (Méndez-Martínez & Rondón-Sepúlveda, 2012).

For the EFA, considering the sample size, the nature of data and the abnormal distribution of data, a parallel analysis was performed with an optimal implementation based on polychoric correlations. The models were appraised with a Diagonally Weighted Least Squares (DWLS) estimator for this analysis and the CFA. To accept the models, the following cutoff values were considered: RMSEA ≤ .08, SRMR ≤ .08, TLI ≥ .95, and CFI ≥ .95 (Hu & Bentler, 1999; Kline, 2011; Xia & Yang, 2019). Reliability estimates were obtained using Cronbach's Alpha (α) and McDonald's Omega (ω), which aimed at establishing the items' internal consistency. As complementary indices, the Factor Determinacy (FD) and the Latent Construct Reliability (HLat) were obtained. The first one shows how the factor scores are reasonable estimates of individual differences given a specific factor (Grice, 2001; Rodríguez et al., 2016), and the second one assesses how well the factor can be identified by the continuous latent response variables that underlie the observed item scores (Ferrando & Lorenzo-Seva, 2017).

Results of the final structure were crossed with the sociodemographic variables in search of

differences via a Kruskal-Wallis Test (H-test) (if an abnormal distribution was found *via* a Shapiro-Wilk-Francia normality test). The size effect was calculated with the epsilon squared coefficient (E^2_R) (Ventura-León, 2019).

For all analyses, a *p*-value of .05 was considered for statistical significance. The EFA was implemented with FACTOR 12.02.01 (Ferrando & Lorenzo-Seva, 2017), and the rest of the descriptive and bivariate analyses were performed in *R* software (R Core Team , 2022) using the packages: "stats" (R Core Team , 2022) "readxl" (Wickham & Bryan, 2023), "dplyr" (Wickham et al., 2023), "summarytools" (Comtois, 2022), "psychometric" (Fletcher, 2022), "usf" (Peters &

Gruijters, 2021), "tm" (Feinerer & Hornik, 2023), "psych" (Revelle, 2024), "MVN" (Korkmaz et al., 2014), "lavaan" (Rosseel, 2012), "semTools" (Jorgensen et al., 2022).

Results
Sample- Participants

Two samples were obtained, one for the EFA and another for the CFA. Table 1 shows the main results; and a proportion test was performed for both samples to check the equivalence between the two samples.

Table 1
Descriptive sample statistics.

Characteristics		Sample 1 (EFA) 220	Sample 2 (CFA) 204	*p-value*
Age	Early adulthood	30(14%)	33(16%)	0.462
	Adulthood	181(82%)	162(79%)	0.532
	Late adulthood	9(5%)	9(4%)	1.000
Sex	Male	66 (30%)	76 (37%)	0.139
	Female	154 (70%)	128 (63%)	
City of residence	Bogotá	118 (54%)	138(68%)	**0.004***
	Other	102(46%)	66 (32%)	
Income level	Low	54(26%)	48(24%)	0.895
	Medium	121(55%)	125 (61%)	0.226
	High	45(20%)	31(15%)	0.199
Educational level	Elementary – High school	33(15%)	35(17%)	0.636
	Technical	33(15%)	25(12%)	0.496
	Bachelor	68(31%)	68(33%)	0.667
	Postgraduate	86(39%)	76(37%)	0.773
Working experience with children	Yes	88 (40%)	109(53%)	**0.007***
	No	132 (60%)	95(47%)	
Previous episode of cyber-harassment	Yes	16 (7%)	17(8%)	0.681
	No	203(93%)	185(92%)	
Knowledge of official reporting mechanisms of cyber-harassment	Yes	69(31%)	72(35%)	0.450
	No	151(69%)	132(65%)	

Note. Significant differences were found in the variables: city of residence and previous working experience with children.

Content validity evidence

Scores above .75 on the CVI were sufficient to consider the essentiality of an item (Lawshe, 1975). In this case, 22 were retained without any modifications (64%), 3 were modified according to the judge's criteria (9%) and 8 items were excluded from the scale's final version (24%). Table 2 shows the main results obtained.

Table 2
Content Validity Evidence Results.

Item	Clarity	Relevance	Coherence	Average CVI	Decision
I1	1,00	1,00	1,00	1,00	M
I2	0,50	0,50	0,75	0,58	Ex
I3	0,75	1,00	1,00	0,92	M
I4	0,50	1,00	1,00	0,83	M
I5	0,75	1,00	0,75	0,83	M
I6	0,75	1,00	1,00	0,92	M
I7	0,75	1,00	1,00	0,92	M
I8	0,75	0,75	1,00	0,83	M
I9	1,00	1,00	1,00	1,00	M
I10	1,00	1,00	1,00	1,00	M
I11	0,50	-0,50	-0,75	-0,25	Ex
I12	1,00	0,50	0,75	0,75	Ad
I13	0,75	0,75	0,75	0,75	Ad
I14	1,00	1,00	1,00	1,00	M
I15	0,50	1,00	1,00	0,83	M
I16	0,75	0,25	0,25	0,51	Ex
I17	0,50	0,75	1,00	0,75	Ad
I18	0,75	0,75	0,50	0,66	Ex
I19	0,75	1,00	1,00	0,92	M
I20	0,50	0,50	0,25	0,40	Ex
I21	0,50	0,75	0,75	0,66	Ex
I22	0,75	0,00	0,00	0,25	Ex
I23	0,50	0,75	0,50	0,58	Ex
I24	1,00	1,00	1,00	1,00	M
I25	0,75	1,00	1,00	0,92	M
I27	1,00	0,75	0,75	0,83	M
I28	1,00	1,00	1,00	1,00	M
I29	0,75	1,00	1,00	0,92	M
I30	1,00	1,00	1,00	1,00	M
I31	1,00	0,75	0,75	0,83	M
I32	1,00	0,50	0,75	0,75	M
I33	1,00	1,00	1,00	1,00	M
I34	1,00	1,00	1,00	1,00	M

Note. *I* = Items; *M* = Maintained without any modifications; *Ad* = Adjusted to judge's recommendations and Ex = Excluded from the instrument.

Exploratory Factor Analysis

Regarding the results of shape forms, 13 items were excluded from the analysis, leaving 12 items. After the HI analysis, another 3 more items were excluded, and for the MSA, one additional item was excluded, leaving a total of 8 items for the EFA. An optimal KMO (.88) and a significant Bartlett's Sphericity test ($p < .001$) were obtained, confirming the polychoric matrix adequacy to perform an EFA. The Mardia multivariate normality test showed an abnormal data distribution ($p > .05$).

The parallel analysis yielded 1 main factor; one item showed a high presence of residual, be-

ing excluded from the final version. The resulting structure explains 64.27% of the variance; its fit was obtained RMSEA = .07, SRMR = .05, CFI = .99 and TLI = .99. All items had adequate communalities (Mean = .60, Min = .30, Max = .89) and optimal factor loadings (Mean = .76, Min = .55, Max = .95), as well as good internal consistency indices (α = .90, ω = .91, FD = .98, HLat = .96). Table 3 shows the resulting scale structure, which includes the final 7 items, its factors loadings and communalities, and the respective descriptive statistics, as it has been suggested by the specialized literature (Muñíz & Fonseca-Pedrero, 2019).

Table 3
Final Scale Structure.

	Items	L	C	HI	M	Sk	K
A1	I am responsible for reporting a cyber-harassment situation that occurs to any child and/or adolescent [*Soy responsable de reportar una situación de ciberacoso que se le presente a cualquier niño, niña y/o adolescente*].	0.76	0.57	0.58	4.50	-2.16	4.33
A2	Depending on the severity, I would report a case of cyber-harassment [*Dependiendo de la gravedad, reportaría un caso de ciberacoso*].	0.66	0.43	0.43	4.44	-1.93	2.93
A3	When seeing a material in which a boy, girl or adolescent is ridiculed on social networks, I would report it [*Al ver un material en el que se ridiculice a un niño, niña o adolescente en redes sociales lo reportaría*].	0.94	0.88	4.56	4.56	-2.14	4.82
A4	I feel safe to report a case of cyber-harassment, even if I am not completely clear about the situation [*Me siento seguro/a de reportar un caso de ciberacoso, aunque no tenga total claridad de la situación*].	0.61	0.37	3.54	3.54	-0.45	-0.87
A5	The content of social networks in which a child or adolescent is mocked must be reported [*El contenido de redes sociales en el que se hace burla de algún niño, niña o adolescente debe ser reportado*].	0.95	0.89	4.61	4.61	-2.38	6.21
A6	If I see on social networks that the publication of a child or adolescent receives offensive comments, I would report it [*Si veo en redes sociales que la publicación de un niño, niña o adolescente recibe comentarios ofensivos lo reportaría*].	0.88	0.78	4.37	4.37	-1.56	1.66
A7	I would feel more at ease reporting a case of cyberbullying to the authorities rather than to the victim's family [*Me sentiría más tranquilo/a informando un caso de ciberacoso ante las autoridades en lugar de hacerlo ante la familia de la víctima*].	0.55	0.30	3.75	3.76	-0.66	-0.62

Note. *L* = Factor Loadings; *C* = Communality; *HI* = Homogeneity Index; *M* = Mean; *Sk* = Skewness; *K* = Kurtosis.

Confirmatory Factor Analysis

After the resulting structure, a new sample was collected (see Table 1) and a multivariate Mardia normality test was performed, resulting in an abnormal distribution ($p > .05$). A CFA confirmed the structure found in the EFA, RMSEA = .03, SRMR = .04, CFI = .96, TLI = .95. All items had adequate factor loadings (Mean = .63, Min = .438, Max = .816). This model had good internal consistency indices (α = .80, ω = .89). The results can be seen in the following SEM graphic (Figure 1).

Bivariate analysis

Regarding this analysis, a Shapiro-Wilk-Francia normality test was first performed, finding an abnormal distribution ($p < .05$). A Kruskal Wallis test was conducted (with the whole sample, $n = 424$), finding differences between age, education level, working experience with children and knowledge of the official report mechanisms. However, it was found to be almost a null effect size. Table 4 shows the results.
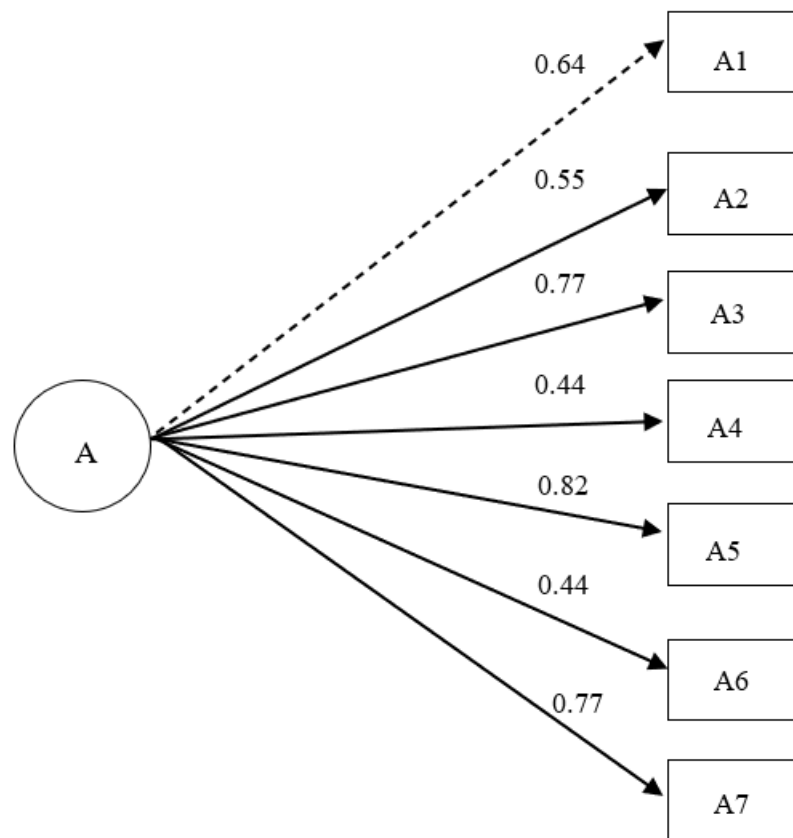

Figure 1.
Graphical CFA representation.

Table 4
Bi-variate analysis.

Characteristics		Mean	*p-value*	Size effect
Age	Early adulthood	27.11		
	Adulthood	30.30	**< 0.001***	0.06
	Late adulthood	28.33		
Sex	Male	29.43	0.738	-
	Female	29.90		
City of residence	Bogotá	29.87	0.485	-
	Other	29.54		
Income level	Low	30.35		
	Medium	29.75	0.236	-
	High	28.89		
Educational level	Elementary – High school	30.35		
	Technical	29.98	**0.016***	0.02
	Bachelor	28.89		
	Postgraduate	30.11		
Working experience with children	Yes	29.47	**0.026***	0.01
	No	29.97		
Previous episode of cyber-harassment	Yes	30.06	0.639	-
	No	29.70		
Knowledge of official reporting mechanisms of cyber-harassment	Yes	29.03	**0.013***	0.01
	No	30.81		

Note. Early adulthoods had the least favorable level of attitudes, the size effect only was calculated for the variables which were significant.

Discussion

The present study presents the first initial validation study of an attitude scale towards reporting cases presented in children and adolescents directed to the general community. As a strength of the study, the resulting scale has a content validity evidence, a piece of evidence that is not usually reported by health and social sciences studies (Zapata-Ospina & García-Valencia, 2022), which helped to adjust items and remove the ones that did fit the expert judge's criteria for not being a good reflect of the measured construct.

Along the same lines, this study has two main internal structure validity evidences, as suggested when conducting psychometric studies (Lloret-Segura et al., 2014), which confirmed the unidimensional structure of the construct of the study, having optimal reliability indices. To accomplish the model fit, it was beneficial to include only direct items, as suggested by specialists in the literature (Suárez-Álvarez, et al., 2018), and many item filters before the EFA, such as the shape forms and the HI and MSA. This structure is theoretically coherent with the conceptualization of attitudes, which states that the attitudes' components are complicated to segregate, suggesting the existence of a unidimensional structure to comprehend this construct (Valdivieso-Taborga, 2013; Makanyeza, 2014). Moreover, this scale has

a similar length and structure to another construct related scales (e.g. Barlett et al., 2016; Cesario et al., 2018; Gomes-Cavalcanti et al., 2021; Walsh et al., 2010).

Regarding the bivariate analysis, an hypothesis was to find significant differences between age (Sakellari et al., 2022; Stefani, 2005), sex (Garaigordobil & Aliri, 2013; Cava et al., 2020; Rivadulla-López & Rodríguez-Correa, 2019; Rotundo et al., 2001; Yee et al., 2015), education and income level (Sánchez-Díaz, 2019). Even though initial differences between age and education level were found, the size effect was almost null. The analysis included variables relating to working experience with children, previous episodes of cyber-harassment and knowledge of official reporting mechanisms of cyber-harassment because it has been stated that the direct experiences with aspects of the attitudes object may have an incidence in the attitude formation (Verplanken & Orbell, 2022). However, this variable did not present any significant difference. The last results help to conclude that there may be no differences of attitude level in any socio-demographic characteristics.

Our study may help implement preventive interventions involving cases of cyber-harassment among the general community, taking into account the important role that attitudes play in reporting cases of harassment (Verplanken & Orbell, 2022). However, some limitations, such as the lack of convergent and divergent validity evidence, can be considered. It has been stated that regard may be an influential variable in attitude formation (Foster & Fullagar, 2018), even social desirability (Krumpal, 2013) or acquiescence (Valentini, 2017). Furthermore, the sampling method is an element that limits the results obtained, reflected in the differences found between the samples. For future research, more robust sampling methods would be needed. In addition, it is recommended to establish association models to find which variables may be included in the attitudes towards reporting cases of cyber harassment in children and adolescents.

Data availability

The datasets generated during the project and analyzed during the current study are available in the Repository Open Science Framework: https://osf.io/z2w9y.

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