Cyberbullying among children and youth in Türkiye: A systematic review and meta-analysis

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ABSTRACT

Problem: It has been reported in various studies that identifying risk and protective factors and outcomes of cyberbullying perpetration (CP) and cyberbullying victimization (CV) is crucial for educational strategies to fight against cyberbullying. The main purpose of the present study is to conduct a meta-analysis and systematic review to identify which risk and protective factors are more strongly associated with CP/CV and possible consequences of CP/CV among children and youth in Türkiye.

Eligibility criteria: Various databases, including PubMed, Web of Science (WoS), ProQuest, ERIC, SCOPUS, Turkish Psychiatry Index, DergiPark, and National Dissertation/Thesis Center of Türkiye were searched to identify relevant studies.

Sample: Fifty-nine studies met the inclusion criteria included in the present study.

Results: Results revealed that the strongest risk factor was traditional bullying for CP ($r = 0.47$, $p < .001$) and traditional victimization for CV ($r = 0.43$, $p < .001$). The strongest protective factor was social skill for CP ($r = -0.45$, $p < .001$) and empathy for CV ($r = -0.25$, $p < .001$). In addition, involvement in CP behaviors had the strongest effect on negative self-concept ($r = 0.28$, $p < .001$), while exposure to CV on anxiety ($r = 0.35$, $p < .001$).

Conclusions: Although this study has some limitations, the study's findings are important source of information for many professionals, such as pediatric nurses, school psychological counselors, psychologists, and policy-makers to further educational strategies for children and young people in Türkiye.

Implications: The study findings would be useful for developing educational programs to strengthen protective factors and reduce risk factors to prevent cyberbullying perpetration behaviors.

Introduction

The internet provides an easy and fast way with minimal cost to communicate with others, meet and chat with new people, share ideas, shopping, access information, and education (Erbiçer, 2019; Erdur-Baker & Kavşut, 2007; Nixon, 2014; Tokunaga, 2010). The internet usage is increasing daily in most areas of our lives (Erdur-Baker & Kavşut, 2007; Nixon, 2014; Tokunaga, 2010). However, the unlimited possibilities in information and communication technologies (ICTs), being easily accessible, and lack of controls result in some people using the internet to harm others (Erdur-Baker & Kavşut, 2007; Nixon, 2014; Tokunaga, 2010). Cyberbullying perpetration (CP), a form of this harmful behavior, can be defined as the deliberate, repetitive, and damaging attitude of individuals or groups harming others using the internet, mobile phone, or other communication tools such as e-mail, messages, or social media (Juvonen & Gross, 2008; Li, 2007; Ortega Ruiz et al., 2012; Patchin & Hinduja, 2006; Slonje & Smith, 2008; Smith et al., 2006). Some examples of CP behaviors are insulting or threatening others using social media tools, posting photos or videos of others online without permission, chatting on social media tools or dating sites using others' photos, stealing someone's account information, online sexual harassment, and spreading rumors about others (Erdur-Baker & Kavşut, 2007; Juvonen & Gross, 2008; Patchin & Hinduja, 2006; Shariff, 2005; Vandebosch & Van Cleemput, 2008; Willard, 2007). Exposure to cyberbullying victimization (CV) negatively affects children and young individuals' social, emotional, cognitive, and academic performance

(Hinduja & Patchin, 2010; Smith et al., 2008; Ybarra & Mitchell, 2004). Studies on this issue illustrated that involvement in CP behaviors or exposure to CV are associated with low self-esteem, depression, anxiety, substance use, smoking and alcohol use, anger, aggressive behavior, risky online behavior, traditional bullying and victimization, and problematic family and friend relationship (Chen et al., 2017; Guo, 2016; Fisher et al., 2016; Foody et al., 2017; Hinduja & Patchin, 2008; Kowalski et al., 2014; Kowalski & Limber, 2007; Patchin & Hinduja, 2011; Srabstein & Piazza, 2008; Zych et al., 2019).

The number of studies on CB/CV has continued to increase over the last two decades in Türkiye to understand in detail this phenomenon (Aricak et al., 2008; Dilmaç & Aydoğan, 2010; Erdur-Baker & Kavşut, 2007; Inseloz & Ucanok, 2013; Özdemir & Akar, 2011; Topcu & Erdur-Baker, 2016). Previous studies conducted in Türkiye revealed that problematic internet use, being a traditional bully or victim, internet addiction, risky internet behavior, anger, aggression, and hostility were risk factors for CP/CV (Erbiçer, 2019; Eroğlu & Güler, 2015; Tural Hesapçıoğlu & Ercan, 2017; Kocatürk, 2014; Ünver & Koç, 2017; Şimşek et al., 2019; Peker, 2015), while individuals' empathic tendency, social support perceived by family members and peers, extroversion, and social skills were protective factors (Ateş & Güler, 2016; Erbiçer et al., 2017; Eroğlu & Güler, 2015; Özden & İçellioglu, 2014; Peker et al., 2012). In addition, the studies in Türkiye focusing on the consequences of CP/CV illustrated that involvement in CP behaviors or being CV leads to a decrease in self-esteem, life satisfaction, and academic achievement and an increase in stress, anxiety, depression, somatic symptoms, and suicidal thoughts (Tural Hesapçıoğlu and Ercan, 2017; Kırcaburun et al., 2019; Sümengen & Akyüz, 2020). Although there have been many studies on risk and protective factors and outcomes of CB/CV in Türkiye, unlike other societies (Albdour & Krouse, 2014; Antoniadou & Kokkinos, 2015; Foody et al., 2017; Jadambaa et al., 2019; Kim et al., 2017), there are no studies examining comprehensively which of these risk and protective factors are more strongly associated with CP/CV, and possible consequences of CP/CV. Therefore, it would be useful to conduct a systematic review and meta-analysis of the studies conducted in Türkiye to clarify risk and protective factors and outcomes of CP/CV. Furthermore, it is thought that determining the predictor factors (i.e., risk and protective) and consequences of CP/CV will contribute to developing effective prevention and intervention programs to fight against cyberbullying. This study will also guide many professionals, such as pediatric nurses (Carpenter & Hubbard, 2014; Long, 2021; Özdemir & Bektaş, 2021; Sarman & Tuncay, 2023; Uludasdemir & Kucuk, 2019), school psychological counselors, and psychologists (Burnham et al., 2011; Elbedour et al., 2020; Erbiçer et al., 2023; Zalaquett & Chatters, 2014), to educate children, families, and adolescents through effective practices in dealing with cyberbullying and encourage them to cope with this phenomenon effectively.

For these purposes, the following questions were addressed:

Research Question 1 (RQ1): Which risk and protective factors and outcomes are more strongly associated with CP/CV?

Research Question 1 (RQ1): How do the separate relationship between risk and protective factors and outcomes and CB/CV change as a function of moderators?

Method

The PRISMA 2020 statement: An updated guideline for reporting systematic reviews (Page et al., 2021) was followed in reporting this systematic review and meta-analysis.

Literature search

The literature search was conducted between September and December 2020. The studies included in this study consisted of master/doctoral theses and peer-reviewed articles on CP/CV in Türkiye. PubMed, Web of Science (WoS), ProQuest, ERIC, and SCOPUS electronic databases were searched to identify relevant studies. In addition, queries were made in the Turkish Psychiatry Index, DergiPark, and the National Thesis Center of Türkiye. The references of the included studies were also examined to identify studies that might be relevant. Search terms in Turkish and English were used for the literature search. Search terms used for the literature review are given in Online Resource 1.

Inclusion and exclusion criteria

A list of inclusion and exclusion criteria was generated to identify relevant studies. The criteria used in the selection of the studies were: a) studies conducted in Türkiye, b) examining the relationship between risk/protective factors and CP/CV, c) focusing on the consequences of CP/CV, d) sufficient data to calculate effect size (e.g., correlation coefficient (r), and regression coefficients $(B$ and $\beta)$), e) sample consisting of children and young people (i.e., age range of the sample was from 10 to 26 (APA, 2023a, 2023b, 2023c), f) studies publishing in English or Turkish, 8) data from a single study have been included where the same data are reported in different studies. Exclusion criteria: a) studies involving participants over the age of 26, b) letters to editor, c) qualitative studies, d) experimental studies, e) conference presentations, f) non-peer-reviewed journals, g) studies using measurement tools that lack validity and reliability, 8) studies with insufficient data to calculate effect size, 9) studies with clinical samples, 10) studies with teachers, administrators, or parents.

The databases mentioned above were searched by four authors (MY, VD, SE, and ESE). A total of 1410 studies were retrieved in the first wave of the searching. After removing 171 duplicate records, 1239 studies remained. In the following stage, the remaining records' titles or/and abstracts were screened for eligibility, and 1061 studies were excluded. Further screening of 178 retained studies indicated that 119 studies had to be excluded for reasons such as experimental and interventional studies ($n = 19$), qualitative studies ($n = 12$), clinical samples ($n = 6$), studies focusing on teachers and parents ($n = 21$), insufficient data to calculate effect size ($n = 33$), specific populations ($n = 10$), and out of age range ($n = 18$). Finally, fifty-nine studies were included in the present study based on inclusion and exclusion criteria. The results of the literature search in databases are presented in Fig. 1.

Variables

CP and CV measures included any form of violence in the online environment, such as internet harassment, online harassment, digital bullying, social media bullying, electronic aggression, and text message bullying/victimization. Both CP and CV, assessed separately in the studies focusing on cyberbullying, were included in this study as they were considered different variables. In addition, the term "risk factor" (e.g., problematic internet usage, age, traditional bullying or victimization, internet addiction, anger, aggression, risky online behavior, and hostility) and "protective factor" (e.g., family support, friend support, empathy, social skill, and extrovertedness) refer to individual, environmental, psychological, clinical, family, peer, and behavioral variables that are thought to result in CP behaviors or CV. The term "outcome," including anxiety, depression, self-esteem (negative), negative self-concept, well-being (negative), and somatization, refers to symptoms of mental health conditions that are thought to result from involvement in CP behaviors or being CV.

Coding and quality assessment

A coding key was created to determine the studies to be included in the meta-analysis and to facilitate data analysis. The author's name and publication year, sample size, gender distribution of the participants, average age or age range of the sample, education level of the sample, and key findings of the studies were entered into the coding sheet. In addition, the correlation values for the relationship between CP/CV and
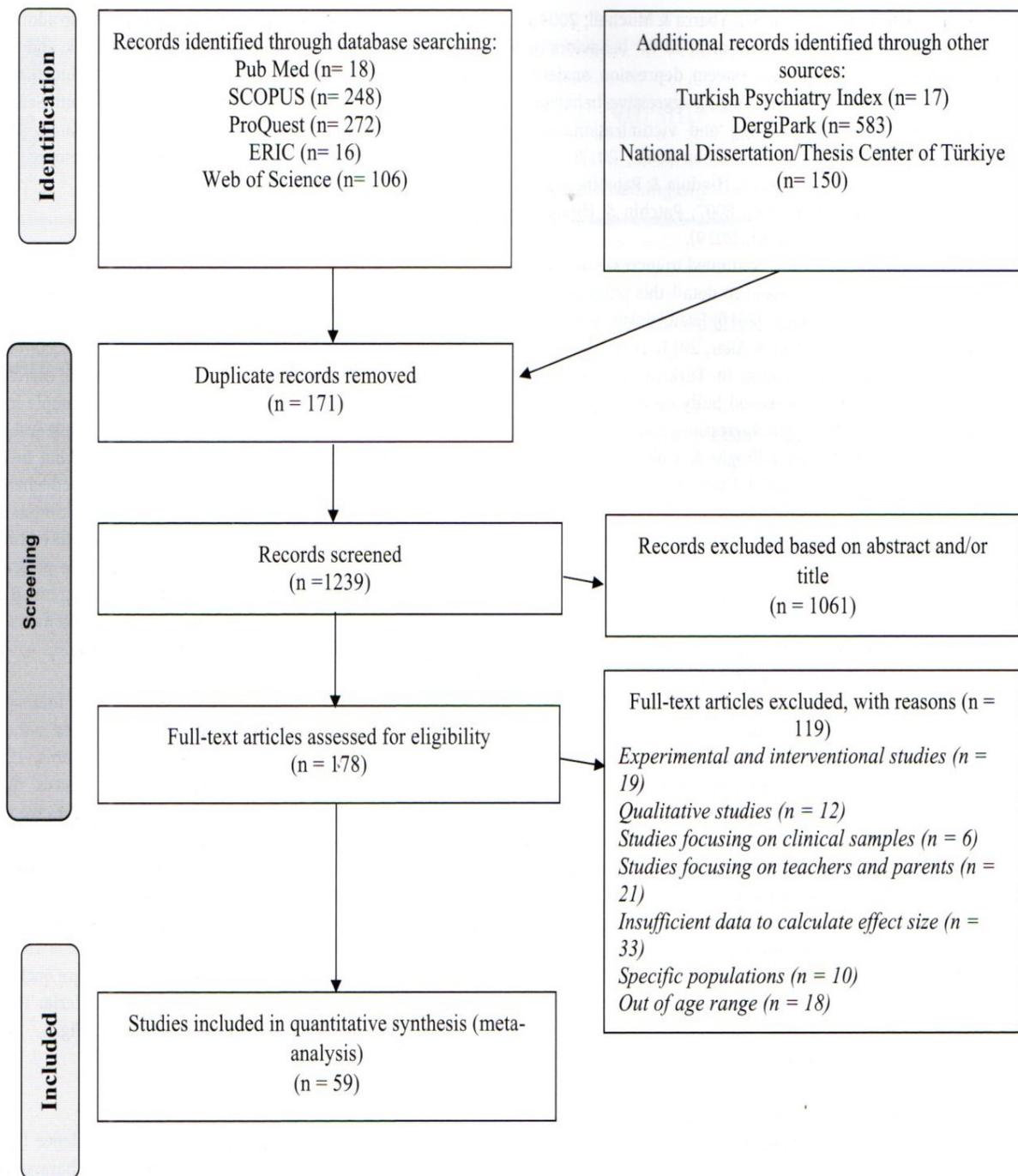
Fig. 1. PRISMA flow diagram of literature search.

risk and protective factors and outcomes were entered. The coding sheet was also coded by three authors independently to avoid errors in data entry, and intercoder reliability of 0.93 was achieved.

The Quality Assessment Tool for Observational Cohort and Cross-Sectional Studies (Feng et al., 2014) was used for the quality assessment of the studies included in this meta-analysis. This assessment tool consists of 14 items. Possible answers that can be given are: yes, no, and other (can not determine (CD), not applicable (NA)), and not reported (NR)). Scoring over 11 shows that the study has good quality, a score between 7 and 10 is fair quality, and a score of 6 and below indicates the study has poor quality. Of the 59 studies included in this study, twenty-two were rated as good quality, and thirty-seven were rated as fair quality. Quality Assessment was performed by two authors. Afterward, quality assessments were compared with a Kappa coefficient (0.82), and disagreements were resolved by consensus.

Data analysis

Direct correlation coefficients are not used in meta-analysis studies. Instead, the correlation values reported in the studies included were converted to the Fisher z value. Therefore, analyses were performed on Fisher z values. Then, while the meta-analysis findings were reported, the values were converted to the correlation coefficient (Borenstein et al., 2011). Cohen (1988, 1992) classified the effect sizes of the correlation coefficient as follows: small ($r = 0.10$), medium ($r = 0.30$), and large ($r = 0.50$).

Q test is generally used to evaluate the heterogeneity between studies included in a meta-analysis. The Q statistic is used to test the null hypothesis claiming that all studies share a common effect size with the chi-square distribution (Borenstein et al., 2011). I^2 value was used as another criterion for heterogeneity in the present study. I^2 gives the ratio of the total variance for the effect size. An I^2 value of 25% is interpreted as low, 50% as medium, and 75% as high level of heterogeneity (Cooper et al., 2019).

All studies included in a meta-analysis are similar, and the aim is to generalize the calculated effect size to other samples of the same population; the fixed-effect model is recommended. On the other hand, if the researcher collects data from a series of studies performed by others, the random-effects model is recommended as it is unlikely that all studies are functionally equivalent (Borenstein et al., 2010). However, if

the number of studies included in a meta-analysis is five or less, the fixed-effect model is more reliable due to uncertain variance prediction (tau-squared). With six or more studies, the random effect model is recommended for increased reliability (Hedges & Vevea, 1998). Effect size calculations were based on the random effects model k (number of studies) ≥ 6 and fixed effects model k ≤ 5 in the current study.

In addition, fail-safe (fail-safe N) values for each effect size were examined to determine publication bias in this study. It is recommended that the calculated Fail-safe N value is $>5 k + 10$ (k = the number of observed effect sizes). When the fail-safe N is below the critical value, it shows that the meta-analysis result may be open to publication bias (Rosenthal, 1979). The funnel plot was also examined to determine the publication bias. In the funnel plot, the effect size of the studies is spread symmetrically around the general effect size in case of no evidence of publication bias, while a skewed and asymmetrical distribution is expected in case of publication bias (Borenstein et al., 2011). Comprehensive Meta-Analysis (CMA Version 3.0) program was used for data analysis.

Results

Study characteristics

Fifty-nine studies, including 34.068 participants, were included in the systematic review and meta-analysis. Thirty-nine (66.1%) of these studies were dissertations/theses, and twenty (33.9%) were peer-reviewed articles. The studies' publication year range was between 2012 and 2020. Twenty (33.9%) studies were conducted between 2010 and 2015, and thirty-nine (66.1%) studies between 2016 and 2020. While only seven (11.9%) studies had been published in English, the remaining fifty-two (88.1%) studies had been published in Turkish. The age range of the participants in the studies included was between 10 and 26 age. In fourteen (23.7%) studies, the age range or mean age was not specified (four studies focused on primary/secondary school students, and ten on high school students). The education range of the participants in the studies included was between primary school and university. More than half (57.6%) of the studies focused on high school students. Of the samples, 22.0% were university students, and 20.4% were primary/secondary school students. Both females and males were included in all studies included. In forty-one (69.49%) studies, there were more female participants than males. Detailed information about the studies included in the present study is provided in Table 1.

Publication bias and heterogeneity

Classic fail-safe N values were calculated for the relationships between CP and risk factors (PIU, $N = 256$; traditional bullying, $N = 630$; traditional victimization, $N = 289$; internet addiction, $N = 1847$; anger, $N = 346$; aggression, $N = 114$; ROB, $N = 276$; hostility, $N = 346$), protective factors (family support, $N = 84$; empathy, $N = 210$; social skill, $N = 190$), and outcomes (anxiety, $N = 92$; depression, $N = 320$; self-esteem, $N = 203$; NSC, $N = 118$; somatization, $N = 51$) to determine publication bias in the study. In addition, classic fail-safe N values were calculated for the relationships between CV and risk factors (traditional bullying, $N = 312$; traditional victimization, $N = 441$; internet addiction, $N = 311$; anger, $N = 99$; hostility, $N = 236$), protective factors (family support, $N = 32$; friend support, $N = 73$; empathy, $N = 36$) and outcomes (anxiety, $N = 1027$; depression, $N = 437$; self-esteem, $N = 270$; NSC, $N = 184$; somatization, $N = 197$). These values showed no evidence of publication bias (see Tables 2 and 3). On the other hand, the classic fail-safe N values calculated for the relationships between CP and age ($N = 39$), friend support ($N = 16$), extrovertedness ($N = 24$), psychological well-being ($N = 23$); and CV and extrovertedness ($N = 14$), age ($N = 4$), and psychological well-being ($N = 0$) showed publication bias (see Tables 2 and 3). However, funnel plots showed no evidence of publication bias.

Q test and I^2 value were used to evaluate the heterogeneity between the studies included in the present study. There were no evidence of heterogeneity between studies included to determine the relationships between CP and internet addiction ($Q = 13.91, p > .05; I^2 = 49.75$), aggression ($Q = 1.41, p > .05; I^2 = 0.49$), hostility ($Q = 10.23, p > .05; I^2 = 51.14$), friend support ($Q = 0.60, p > .05; I^2 = 0.00$), NSC ($Q = 0.06, p > .05; I^2 = 0.00$), somatization ($Q = 4.49, p > .05; I^2 = 55.49$); and associations between CV and hostility ($Q = 5.70, p > .05; I^2 = 29.87$), family support ($Q = 6.13, p > .05; I^2 = 67.39$), somatization ($Q = 0.96, p > .05; I^2 = 0.00$), depression ($Q = 7.30, p > .05; I^2 = 17.85$). However, the studies included to identify the associations of other risk and protective factors, and outcomes with CP/CV indicated a high level of heterogeneity (see Tables 2 and 3).

Results of meta analysis

Results of cyberbullying perpetration

Average effect size (ESr), sample size (N), heterogeneity statistics (Q and I^2), publication bias (fail-safe N), and the relationships between CP and risk and protective factors, and outcomes are presented in Table 2. The associations of risk factors with CP showed that there were statistically significant and medium relationships between CP and problematic internet usage ($r = 0.42, p < .001$), traditional bullying ($r = 0.47, p < .001$), internet addiction ($r = 0.36, p < .001$), and risky online behavior ($r = 0.35, p < .001$). There were also statistically significant and small relationships between CP and traditional victimization ($r = 0.28, p < .001$), anger ($r = 0.24, p < .001$), aggression ($r = 0.29, p < .001$), hostility ($r = 0.25, p < .001$), and age ($r = 0.07, p < .05$).

The results of the average effect sizes for protective factors examining CP showed that there was statistically significant and medium relationship between CP and social skill ($r = -0.45, p < .001$). There were also statistically significant and small relationships between CP and family support ($r = -0.18, p < .001$), friend support ($r = -0.13, p < .001$), empathy ($r = -0.22, p < .001$), and extrovertedness ($r = -0.09, p < .001$).

In terms of outcomes, there were statistically significant and small relationships between CP and anxiety ($r = 0.23, p < .001$), depression ($r = 0.22, p < .001$), somatization ($r = 0.22, p < .001$), negative self-concept ($r = 0.28, p < .001$), self-esteem ($r = -0.21, p < .001$), and psychological well-being ($r = -0.11, p < .001$).

Results of cyberbullying victimization

Average effect size (ESr), sample size (N), heterogeneity statistics (Q and I^2), publication bias (fail-safe N), and the associations of risk and protective factors and outcomes with CV are presented in Table 3. The associations of risk factors with CV showed that there were statistically significant and medium relationships between CV and traditional victimization ($r = 0.43, p < .001$), traditional bullying ($r = 0.36, p < .001$), and internet addiction ($r = 0.32, p < .001$). There were also statistically significant and small relationships between CV and anger ($r = 0.26, p < .001$) and hostility ($r = 0.26, p < .001$). There was a small association between age and CV ($r = 0.04, p > .05$), but this relationship was not statistically significant.

The results of the average effect sizes for protective factors examining CV showed that there were statistically significant and small relationships between CV and family support ($r = -0.16, p < .001$), friend support ($r = -0.17, p < .001$), empathy ($r = -0.25, p < .001$), and extrovertedness ($r = -0.09, p < .001$).

In terms of outcomes, there were statistically significant and medium relationships between CV and anxiety ($r = 0.35, p < .001$), self-esteem ($r = -0.31, p < .001$), and somatization ($r = 0.30, p < .001$). There were also statistically significant and small relationships between CV and depression ($r = 0.27, p < .001$) and negative self-concept ($r = 0.27, p < .001$). There was a small association between CV and psychological well-being ($r = -0.03, p > .05$), but this relationship was not statistically significant.

Table 1

Characteristics of the studies included in the systematic review and meta-analysis.

Author/s(year)	Publication type	Sample size	Sample gender (female %)	Sample age (M or/and Range)	Education level of sample	Cyberbullying type (CP/CV) measured	Risk and protective factors and outcomes measured
Seyhan (2020)	D/T	303	48.5%	N.A.	Primary/ secondary school	CP/CV	Traditional bullying, traditional victimization
Yarar (2019)	D/T	562	55.9%	N.A.	High school	CP/CV	Psychological well-being
Çiçek (2019)	D/T	554	53.4%	N.A.	High school	CP/CV	Problematic internet usage
Durna (2019)	D/T	460	56.0%	N.A.	High school	CV	Anxiety, depression, age
Ciminli (2016)	D/T	489	53.9%	N.A.	High school	CP/CV	Empathy, extrovertedness
Tanrıkulu (2013)	D/T	508	45.1%	14–19 age	High school	CP	Self-esteem, hostility, emphatic tendency, anger, aggression
Ateş and Güler (2016)	PRA	421	54.9%	$M = 15.95$	High school	CP	Social skills
Eroğlu and Güler (2015)	PRA	505	71.1%	17–25 age	University	CP/CV	Risky internet behaviors
Özözen Danacı et al. (2018)	PRA	225	63.1%	18–26 age	University	CP	Internet addiction
Ayas (2014)	PRA	239	59.0%	15–18 age	High school	CP	Depression, anxiety
Unlu et al. (2019)	PRA	140	44.3%	13–14 age	Primary/ secondary school	CP/CV	Empathy
Peker et al. (2012)	PRA	229	57.3%	$M = 16.5$	High school	CP/CV	Empathy
Semerci (2017)	PRA	246	11.0%	15–18 age	High school	CP	Extrovertedness
Yiğit et al. (2018)	PRA	223	58.7%	10–14 age	Primary/ secondary school	CP	Family support
Sümengen and Akyüz (2020)	PRA	516	64.7%	N.A.	High school	CV	Self-esteem
Eroğlu (2014)	D/T	606	54.5%	14–18 age	High school	CP/CV	Problematic internet usage, anger, hostility, extrovertedness, negative self-concept
Padır (2015)	D/T	467	47.8%	N.A.	High school	CP/CV	Extrovertedness, age
Epözdemir (2018)	D/T	348	49.4%	N.A.	Primary/ secondary school	CP/CV	Social skills
Bingöl (2013)	D/T	436	47.0%	14–19 age	High school	CP/CV	Family support, friend support
Akar Çelik (2015)	D/T	363	42.0%	N.A.	High school	CP	Family support, friend support
Yılmaz (2020)	D/T	550	50.0%	18–24 age	University	CP/CV	Family support, friend support
Topçu (2014)	D/T	853	55.8%	14–18	High school	CV	Family support, friend support, age
Yaprak (2017)	D/T	128	58.7%	18–23 age	University	CP	Self-esteem
Akça (2016)	D/T	516	64.7%	N.A.	High school	CV	Self-esteem
Tanrıkulu (2013)	D/T	508	45.1%	14–19 age	High school	CP	Self-esteem, empathy, anger, hostility, aggression
Çetin (2019)	D/T	449	76.8%	17–25 age	University	CP/CV	Psychological well-being
Gönenç (2018)	D/T	450	49.6%	18–26 age	University	CP/CV	Psychological well-being
Güler (2019)	D/T	506	69.2%	18–25 age	University	CP/CV	Psychological well-being
Aydın (2019)	D/T	439	50.3%	14–17 age	High school	CP/CV	Self-esteem, age
Bayar (2010)	D/T	1238	51.9%	$M = 14.8$	Primary/ secondary school, High school	CP/CV	Traditional bullying, traditional victimization, age
Taştekin (2016)	D/T	895	50.3%	14–17 age	High school	CP/CV	Self-esteem, age
Özdemir (2015)	D/T	489	57.7%	14–18 age	High school	CP/CV	Age
Sipahi (2019)	D/T	383	48.2%	10–14 age	Primary/ secondary school	CP/CV	Traditional bullying, traditional victimization
Kocatürk (2014)	D/T	1080	51.0%	11–15 age	Primary/ secondary school	CP/CV	Traditional bullying, traditional victimization
Kırcaburun et al. (2019)	PRA	804	48.0%	14–21 age ($M = 16.20$)	High school	CP	Depression, self-esteem
Şimşek et al. (2019)	PRA	2.422	51.5%	$M = 16.23$	High school	CP/CV	Internet addiction, age
Ildirim et al. (2017)	PRA	198	65.0%	18–25 age	University	CP/CV	Anxiety, depression, hostility, negative self-concept
Tural Hesapçıoğlu & Ercan (2017)	PRA	1240	N.A.	N.A.	High school	CP/CV	Anxiety, depression, hostility, negative self-concept, somatization
Çelik et al. (2012)	PRA	230	41.7%	18–25 age	University	CP/CV	Extrovertedness
Özden and İçellioglu (2014)	PRA	136	61.0%	18–25 age	University	CP/CV	Extrovertedness
Horzum et al. (2019)	PRA	1540	N.A.	14–19 age ($M = 16.90$)	High school	CP	Empathy
Sarıçam et al. (2016)	PRA	326	51.0%	13–18 age ($M = 16.20$)	High school	CP	Social skills

Table 1 (continued)

Author/s(year)	Publication type	Sample size	Sample gender (female %)	Sample age (M or/and Range)	Education level of sample	Cyberbullying type (CP/CV) measured	Risk and protective factors and outcomes measured
Ünver and Koç (2017)	PRA	523	58.9%	14–20 age (M = 16.43)	High school	CP	Problematic internet usage, risky online behavior
Peker (2015)	PRA	393	48.9%	14–17 age (M = 15.84)	High school	CP	Anger, aggression
Summak (2019)	PRA	500	50.4%	18–26 age	University	CV	Anxiety
Özkal (2011)	D/T	453	73.1%	18–26 age (M = 20.59)	University	CP	Anxiety, depression, hostility, negative self-concept, somatization
Karaca (2019)	D/T	513	52.6%	12–15 age	Primary/secondary school	CP/CV	Internet addiction
Akkurt-Nurtan (2019)	D/T	550	59.1%	13–17 age	High school	CP/CV	Internet addiction
Ergüder (2019)	D/T	2060	67.3%	14–17 age	High school	CP/CV	Internet addiction
Kurutaş (2017)	D/T	315	52.1%	18–24 age	University	CP/CV	Internet addiction
Çalışgan (2013)	D/T	632	N.A.	13–15 age	Primary/secondary school	CP/CV	Internet addiction
Gencer (2017)	D/T	779	50.1%	N.A.	Primary/secondary school	CP	Internet addiction
Yelci (2018)	D/T	804	61.8%	12–15 age	Primary/secondary school	CP/CV	Anger, aggression, hostility
Usta (2013)	D/T	955	53.2%	N.A.	High school	CP/CV	Anger
Dalmaç (2014)	D/T	506	57.9%	15–19 age	High school	CP/CV	Anger
Eroğlu (2014)	D/T	606	59.3%	14–18 age	High school	CP/CV	Problematic internet usage, anger, hostility, negative self-concept, extrovertedness
Ünver (2016)	D/T	523	58.9%	14–20 age (M = 16.43)	High school	CP	Risky online behavior
Batmaz (2012)	D/T	407	47.2%	N.A.	Primary/secondary school	CP/CV	Anxiety, somatization, hostility, depression
Dalmaz (2014)	D/T	329	79.0%	18–26 age	University	CP/CV	Anxiety, depression

Note. N.A.: Not Applicable, PRA: Peer-Reviewed Article, D/T: Dissertation/Thesis, CP: Cyberbullying Perpetration, CV: Cyberbullying Victimization.

Table 2

Results of the meta-analysis for cyberbullying perpetration.

Measures	k	N	ESr	95% CI	Z	P_z	Cochran's Q	P_Q	I^2 (%)	Classic Fail Safe N
Risk factors										
PIU	3	1683	0.42	[0.378, 0.457]	18.24	< 0.001	7.74	0.02	74.16	256
Age	6	5950	0.07	[0.027, 0.116]	3.127	0.002	13.16	0.02	61.99	39
Traditional bullying	4	2974	0.47	[0.441, 0.498]	27.76	< 0.001	60.56	< 0.001	96.05	630
Traditional victimization	4	2974	0.28	[0.248, 0.315]	15.76	< 0.001	108.43	< 0.001	97.23	289
Internet addiction	8	7445	0.36	[0.327, 0.389]	20.62	< 0.001	13.91	0.05	49.75	1847
Anger	6	3772	0.24	[0.171, 0.304]	6.74	< 0.001	23.75	< 0.001	78.95	346
Aggression	3	1705	0.29	[0.247, 0.334]	12.36	< 0.001	1.41	0.49	0.00	114
ROB	4	2056	0.35	[0.308, 0.384]	16.36	< 0.001	20.07	< 0.001	85.05	276
Hostility	6	3799	0.25	[0.202, 0.292]	10.32	< 0.001	10.23	0.07	51.14	346
Protective factors										
Family support	5	2077	−0.18	[−0.217, −0.133]	−8.05	< 0.001	32.41	< 0.001	87.66	84
Friend support	3	1349	−0.13	[−0.185, −0.080]	−4.88	< 0.001	0.60	0.75	0.00	16
Empathy	5	3076	−0.22	[−0.254, −0.187]	−12.43	< 0.001	43.14	< 0.001	90.73	210
Social skill	3	1095	−0.45	[−0.493, −0.397]	−15.82	< 0.001	9.77	0.01	79.52	190
Extrovertedness	6	2174	−0.09	[−0.137, −0.053]	−4.42	< 0.001	106.06	< 0.001	95.29	24
Outcomes										
Anxiety	4	2210	0.23	[0.187, 0.266]	10.83	< 0.001	8.68	0.03	65.44	92
Depression	5	2117	0.22	[0.126, 0.304]	4.61	< 0.001	23.43	< 0.001	82.93	161
Self-esteem	5	2774	−0.22	[−0.212, −0.107]	−3.92	< 0.001	29.95	< 0.001	86.65	169
NSC	3	2080	0.28	[0.242, 0.322]	13.22	< 0.001	0.06	0.97	0.00	118
PWB	4	1967	−0.11	[−0.158, −0.070]	−5.07	< 0.001	29.03	< 0.001	89.67	23
Somatization	3	1881	0.22	[0.175, 0.261]	9.62	< 0.001	4.49	0.11	55.49	51

Note. Fail-safe N calculation using the Rosenthal Approach, k = Number of studies, Cochran's Q = Tests of heterogeneity, N = Number of participants in all studies, CI = Confidence interval, PIU = Problematic Internet Usage, PWB = Psychological Well-Being, ROB = Risky Online Behavior, NSC = Negative Self-Concept, Effect size calculations were based on the random effects model $k \geq 6$, fixed effects model $k \leq 5$.

Table 3

Results of the meta-analysis for cyberbullying victimization.

Measures	k	n	ESr	95% CI	Z	P_z	Cochran's Q	P_Q	I^2 (%)	Classic Fail Safe N
Risk factors										
Age	7	4841	0.04	[−0.021, 0.099]	1.27	0.20	25.99	< 0.001	76.92	4
Traditional bullying	3	2621	0.36	[0.321, 0.388]	18.95	< 0.001	51.46	< 0.001	96.11	312
Traditional victimization	3	2621	0.43	[0.402, 0.464]	23.72	< 0.001	37.65	< 0.001	94.69	441
Internet addiction	4	3471	0.32	[0.294, 0.353]	19.76	< 0.001	22.61	< 0.001	86.73	311
Anger	3	2067	0.26	[0.218, 0.299]	12.03	< 0.001	16.32	< 0.001	87.75	99
Hostility	5	2940	0.26	[0.225, 0.293]	14.35	< 0.001	5.70	0.22	29.87	236
Protective factors										
Family support	3	1839	−0.16	[−0.202, −0.112]	−6.79	< 0.001	6.13	0.05	67.39	32
Friend support	4	2344	−0.17	[−0.207, −0.129]	−8.20	< 0.001	36.02	< 0.001	91.67	73
Empathy	3	1028	−0.25	[−0.306, −0.191]	−8.13	< 0.001	11.87	0.01	83.15	36
Extrovertedness	6	2174	−0.09	[−0.132, −0.048]	−4.19	< 0.001	39.41	< 0.001	87.31	14
Outcomes										
Anxiety	8	3884	0.35	[0.190, 0.497]	23.27	< 0.001	204.09	< 0.001	96.57	1027
Depression	7	3384	0.27	[0.238, 0.310]	16.39	< 0.001	7.30	0.29	17.85	437
Self-esteem	4	2366	−0.31	[−0.350, −0.277]	−15.76	< 0.001	158.87	< 0.001	98.11	270
NSC	4	2533	0.27	[0.236, 0.308]	14.02	< 0.001	28.34	< 0.001	89.41	184
PWB	3	1461	−0.03	[−0.081, 0.022]	−1.13	0.26	9.89	0 0.007	79.78	0
Somatization	4	2334	0.30	[0.260, 0.334]	14.76	< 0.001	0.96	0.81	0.00	197

Note. Fail-safe N calculation using the Rosenthal Approach, k = Number of studies, Cochran's Q = Tests of heterogeneity, N = Number of participants in all studies, CI = Confidence interval, PWB = Psychological Well-Being, NSC = Negative Self-Concept, Effect size calculations were based on the random effects model k ≥ 6, fixed effects model k ≤ 5.

Moderator analyses

One of the research questions was about the associations of risk and protective factors and outcomes with CP/CV change as a function of moderators. The main findings revealed that the effect sizes of six variables (i.e., internet addiction, aggression, hostility, friend support, negative self-concept, and somatization) for CP and five variables (i.e., problematic internet usage, hostility, family support, somatization, and depression) for CV were not heterogeneous. However, the distribution of effect sizes was highly heterogeneous for the relationship between CP/CV and the other independent variables (see Tables 2 and 3). These findings showed that the variety of effect sizes can not be explained only by sampling error. Therefore, Analog to ANOVA was conducted to identify the possible source of heterogeneity. It is recommended to have three or more studies in each subgroup for categorical moderator analysis (Borenstein et al., 2011). Possible categorical moderators were publication type and education level of the sample in this study. Analog to ANOVA was solely performed with publication type, meeting the criteria, to identify the moderator effect of publication type on the association of extrovertedness with CP/CV and anxiety with CP/CV.

The results of the subgroup analyses are presented in Table 4. The moderator analyses showed that publication type (D/T vs. PRA) was a significant moderator in the relationship between anxiety and CV (Q = 2.28, $p < .001$). The effect size among peer-reviewed articles ($r = 0.44$) was greater than dissertation/thesis ($r = 0.24$). However, publication type was not a significant moderator in the relationship between extrovertedness and CP ($Q = 0.01$, $p > .05$) and CV ($Q = 0.66$, $p > .05$).

In addition, meta-regression analysis was also requested to determine the possible sources of heterogeneity. Potential continuous moderators were sample size, sample gender (i.e., percentage of female participants), and mean of sample age. Borenstein et al. (2011) recommended ten or more studies ($k > 10$, k = number of studies) to perform meta-regression analysis. However, none of the continuous moderators of the present study met these criteria.

Discussion

This study is the first systematic review and meta-analysis focused on the risk and protective factors and outcomes of CP/CV among children and youth in Türkiye. A meta-analysis of 59 studies, including 34.068 participants, was conducted to reveal which risk and protective factors are more strongly associated with CP/CV and the effect of involvement in CP behaviors and being CV on symptoms of mental health conditions.

The study findings for CP revealed that risk factors, including problematic internet usage, traditional bullying, internet addiction, and risky online behavior, had a medium effect on CP behaviors, while age, traditional victimization, anger, aggression, and hostility had a small effect. Protective factors, including family support, friend support, empathy, and extrovertedness, had a small effect on CP behaviors, while social skill had a medium effect. Involvement in CP behaviors also had a small effect on symptoms of mental health conditions, including anxiety, depression, somatization, negative self-concept, self-esteem (negative), and well-being (negative). In addition, the findings for CV illustrated that risk factors, including traditional bullying, traditional

Table 4

Results of categorical moderator analyses for cyberbullying perpetration and victimization.

	Measures	Moderators	k	N	ESr	95% CI	Q
CP	Extrovertedness	D/T	3	1562	−0.107	[−0.428, 0.238]	0.01
		PRA	3	612	−0.084	[−0.239, 0.075]	
CV	Extrovertedness	D/T	3	1562	−0.114	[−0.167, 0.065]	0.66
		PRA	3	612	−0.115	[−0.298, 0.077]	
	Anxiety	D/T	4	1649	0.242***	[0.196, 0.287]	2.28***
		PRA	4	2235	0.437***	[0.403, 0.470]	

Note. k = Number of studies, Cochran's Q = Tests of heterogeneity, N: Total sample size for all studies, CI: Confidence interval, DT: Dissertation/Thesis, PRA: Peer Reviewed Article, CP: Cyberbullying Perpetration, CV: Cyberbullying Victimization. *$p < .05$. ** $p < .01$. *** $p < .001$.

victimization, and internet addiction, had a medium effect on CV, while anger and hostility had a small effect. However, age had no significant effect on CV. All protective factors (i.e., family support, friend support, empathy, and extrovertedness) also had a small effect on CV. Finally, exposure to CV leads to a medium increase in anxiety and somatization and a small increase in depression and negative self-concept, while leading to a medium decrease in self-esteem. However, exposure to CV had no significant effect on well-being.

The relationship between risk factors and CP/CV showed similarities and differences with some previous meta-analyses focused on cyberbullying (Chen et al., 2017; Guo, 2016; Kowalski et al., 2014). For instance, the current study's findings showed that there is a positive relationship between age and CP, but the association between age and CV is not significant. These findings coincide with a previous meta-analysis focused on predictors of CP and CV (Guo, 2016). Problematic internet usage and risky internet behaviors were important risk factors for CP, while internet addiction for CP/CV in the present study. These findings were also consistent with previous meta-analyses examining the relationship between CP/CV and these variables (Chen et al., 2017; Kowalski et al., 2014). Furthermore, traditional bullying had the strongest effect on CP, while traditional victimization had the strongest effect on CV in the current study. These results showed that those who bully in face-to-face environments tend to be involved in CP behaviors, and those exposed to traditional bullying tend to be victims of cyberbullying. The results of some previous meta-analyses also consistent with these findings (Chen et al., 2017; Guo, 2016; Kowalski et al., 2014).

The study's findings also revealed that the most important protective factors for CP were social skill and empathy, while empathy was the most important protective factor for CV. Considering the relevant literature, Kowalski et al. (2014) and Zych et al. (2019) revealed that empathy is an important protective factor on involvement in CP behaviors. However, the relationship between empathy and CV in the same meta-analyses does not coincide with these findings. Türkiye as a collectivist culture is characterized by higher interaction and interdependence, such as close relationships with family members and other members of the community (Kağıtçıbaşı et al., 2007; Kağıtçıbaşı & Üskül, 2006). The most important features of families in Türkiye are to guide and audit their children (Kağıtçıbaşı et al., 2007; Kağıtçıbaşı & Üskül, 2006). Individuals also have higher interaction with their friends and protect each other from adverse life events (Kağıtçıbaşı et al., 2007; Kağıtçıbaşı & Üskül, 2006). Therefore, it was predicted that family and friend support would be the most important protective factors for both CP and CV. This situation may result from insufficient awareness of families and peers on cyberbullying which is a new phenomenon in Türkiye. Lack of awareness may also have caused these protective factors (i.e., family and friend support) to be less effective on involvement in CP behaviors or exposure to CV than empathy and social skill. Considering the inconsistent findings, further studies should be conducted on this issue to better understand this complex relationships in Türkiye.

The relationship between CP/CV and outcomes, including anxiety, depression, well-being, negative self-concept, low self-esteem, and somatic symptoms, also were overlapped with the results of some meta-analyses focused on CP/CV (Chen et al., 2017; Fisher et al., 2016; Foody et al., 2017; Kowalski et al., 2014). For instance, Kowalski et al. (2014) revealed positive relationships between CP/CV and anxiety and depression, and CV and somatic symptoms, while negative relationship between CP/CV and self-esteem. Furthermore, Chen et al. (2017) showed that there is a positive relationship between CP/CV and depression, and a negative relationship between CP/CV and self-esteem. Fisher et al. (2016) also found negative associations between CV and symptoms of mental health conditions such as depression, anxiety, and somatization.

Finally, moderator analyses were performed to identify the possible sources of heterogeneity, and the findings revealed that the relationship between CV and anxiety (i.e., outcome) was larger in peer-reviewed articles than dissertation/thesis. However, it was found that publication type was not a significant moderator in the relationship between extrovertedness (i.e., protective factor) and CP and CV. Based on these findings, it could be concluded that the source of heterogeneity is not the study characteristic. Heterogeneity may come from different sources such as study location, sample size, education level of the participants, the average age of sample, or a different source in the current study. However, these potential moderators were not included to determine heterogeneity between the studies, as the details were not available for these moderators in the studies included in the present study. Therefore, it should be considered when interpreting the current study's findings.

Implications and future research

This study's findings allow suggestions for pediatric nurses, school counselors, parents, policymakers, and mental health professionals. First, educational actions (i.e., prevention and intervention programs) in Türkiye which aim to protect and support children and young people on cyberbullying should consider risk and protective factors. The current study highlighted that individual, environmental, psychological, family and peer, and behavioral factors such as anger, aggression, hostility, empathy, family and friend support, social skill, and extrovertedness were important predictors, protective or risk factors, on CP and CV. Considering these protective and risk factors, prevention and intervention programs such as coping with anger, developing empathy skills, social skills, and family and peer support should be developed for children and young people. The role of professionals, such as school counselors, pediatric nurses, and psychologists, is crucial in implementing these programs (e.g., increasing social support, emotion regulation, and strengthening social skills) to fight against cyberbullying, which is considered a public health concern that jeopardizes the healthy growth and development of children and adolescents (Burnham et al., 2011; Carpenter & Hubbard, 2014; Erbiçer et al., 2023; Long, 2021; Uludasdemir & Kucuk, 2019). Secondly, adolescents can be taught how to reduce the risks (e.g., problematic internet usage, internet addiction, anger, risky online behaviors) by employing healthy coping strategies, as well as how to seek support from friends and family members. Professional groups such as pediatric nurses and school psychological counselors can develop programs for parents and teachers aimed at reducing risk factors and enhancing protective factors. For instance, they can organize various activities in the hospital environment to foster friend and family support or implement parent/adult programs that focus on enhancing children's social support and social skills. Thirdly, measurement tools that scan risk factors such as anger management problems, aggression, low empathy, unsupportive family and friend support environment, poor social skills, and introversion can also be developed, and follow-up studies should be carried out for children at risk in terms of these factors. Fourthly, the study's findings indicated how necessary and important it is to increase the awareness of individuals regarding the healthy use of the internet and individuals' awareness and coping skills to fight against cyberbullying. Pediatric nurses and school counselors can organize educational programs to raise awareness among children and adolescents regarding cyberbullying behaviors, including the definition and types of cyberbullying, its causes and consequences, digital citizenship, and healthy internet usage (Burnham et al., 2011; Carpenter & Hubbard, 2014; Elbedour et al., 2020; Erbiçer et al., 2023; Long, 2021; Özdemir & Bektaş, 2021; Sarman & Tuncay, 2023; Uludasdemir & Kucuk, 2019; Zalaquett & Chatters, 2014). In addition, some previous studies highlighted that adolescents grow up playing video games, give more importance to visuality and enjoy learning by exploring (Aker & Öztürk, 2015; Bakker et al., 2016; Kourakis & Parés, 2010; Zimmerman & Martinez, 2011). Therefore, it would be beneficial to include techniques suitable for their lifestyles in the material (i.e., educational strategies) to increase children and adolescents' awareness of cyberbullying and their coping skills. Fifthly, the study findings showed that involvement in CP behaviors or exposure to

CV results in several symptoms of mental health conditions, including anxiety, depression, negative self-concept, low self-esteem, and poor well-being. Therefore, providing psychological support services for children and young people exposed to CP behaviors is essential. Pediatric nurses and school counselors can provide children, families, and adolescents with information regarding legal processes; can facilitate the disclosing of children by using screening and measurement tools on CV/CP; and it can be ensured that individuals exposed to cyberbullying receive support from relevant mental health professionals and forensic units (Burnham et al., 2011; Carpenter & Hubbard, 2014; Elbedour et al., 2020; Koçtürk & Yüksel, 2018; Long, 2021; Özdemir & Bektaş, 2021; Sarman & Tuncay, 2023; Uludasdemir & Kucuk, 2019). Finally, further meta-analyses in different cultures are needed to gain a more comprehensive understanding of the effect of cultural settings on cyberbullying and facilitate the comparison of the current study's findings with those from other cultural settings, contributing to a broader and more nuanced comprehension of this phenomenon.

Limitations

This study has some limitations. First, there was a high level of heterogeneity between the studies included in the current study. As a result of the moderator analyses to explain the heterogeneity, only the publication type variable partially explained the heterogeneity. Therefore, it should be considered when interpreting the results of the study. In addition, moderator analyses could not be performed for some variables because of the small number of studies. Therefore, the possible sources of heterogeneity could not be determined. Second, the relationship between aggression, risky online behavior, social skills, and CV could not be examined due to insufficient studies. These variables were associated with CP. Knowing the relationships between these variables and CV could have been an important finding. Third, the relationship between CP and age, friend support, extrovertedness, psychological well-being, and the association of extrovertedness, age, and psychological well-being with CV had publication bias, although funnel plots showed no evidence of publication bias. Therefore, this situation should be considered when interpreting these results. Finally, with the cross-sectional studies included in the present study, the causal aspect of the relationship between CP/CV and risk and protective factors and outcomes cannot be determined.

Conclusion

The current study is the first systematic review and meta-analysis to identify which risk and protective factors are more strongly associated with CP/CV and the effect of involvement in CP behaviors or being CV on symptoms of mental health conditions among children and young people in Türkiye. The study's findings have revealed some similarities with previous meta-analyses. Furthermore, additional pieces of evidence of the higher effect size for peer-reviewed articles in the association between CV and anxiety were found in the current study. Finally, this meta-analysis is an important source of information for pediatric nurses, mental health professionals (e.g., psychological counselors and school counselors), and policymakers to further educational strategies for children and young people in Türkiye.

Publication ethics

All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Informed consent

There was no need for informed consent as the present study was not conducted in human participants.

CRediT authorship contribution statement

Eyüp Sabır Erbiçer: Conceptualization, Methodology, Formal analysis, Investigation, Data curation, Writing – original draft, Project administration, Writing – review & editing. **Vedat Ceylan:** Conceptualization, Methodology, Investigation, Writing – original draft, Writing – review & editing. **Mehmet Hanifi Yalçın:** Conceptualization, Methodology, Investigation, Writing – original draft, Writing – review & editing. **Sinem Erbiçer:** Conceptualization, Methodology, Investigation, Writing – original draft, Writing – review & editing. **Ercan Akın:** Writing – original draft, Writing – review & editing. **Nilüfer Koçtürk:** Writing – original draft, Supervision, Project administration, Writing – review & editing. **Türkan Doğan:** Writing – original draft, Funding acquisition, Supervision, Project administration, Writing – review & editing.

Declaration of Competing Interest

The authors do not report any conflicts of interest.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.pedn.2023.09.003.

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