Journal of Psychopathology and Clinical Psychology / Revista de Psicopatología y Psicología Clínica, 31 **(1), 11-32, 2026**
https://doi.org/10.5944/rppc.45966
https://revistas.uned.es/index.php/rppc
J. Psychopathol. Clin. Psychol. / Rev. Psicopatol. Psicol. Clin.
ISSN 1136-5420

Cyber dating abuse and the dark triad: Exploring the role of sociodemographic, relational and psychological factors

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ABSTRACT

Objective: This study examined the association between cyber dating abuse (CDA), Dark Triad personality traits, loneliness, and hostility, as well as the moderating role of sociodemographic variables (e.g., sex and age) and psychosocial variables (loneliness and hostility) in the relationship between dark triad traits and CDA. **Method:** A quantitative cross-sectional design was employed with a sample of 603 Portuguese participants. The following instruments were administered: a Sociodemographic Questionnaire, the Cyber Dating Abuse Questionnaire, the Dirty Dozen, the Hostility subscale of the Brief Symptom Inventory, and the UCLA Loneliness Scale – Short Form. **Results:** The findings indicated a high prevalence of CDA, with 20.3% of participants reporting perpetration. Dark triad traits, hostility, and loneliness were significantly associated with both victimization and perpetration. Moderation analyses showed that loneliness and social network use moderated the relationship between dark triad traits and CDA. **Conclusions:** Although victims and perpetrators shared several psychosocial characteristics, perpetrators were more likely to report involvement in non-committed relationships lasting longer than one year and higher levels of loneliness.

Keywords: Cyber dating abuse; dark triad; hostility; loneliness.

Ciberabuso en las relaciones de pareja y la tríada oscura: Exploración del papel de los factores sociodemográficos, relacionales y psicológicos

RESUMEN

Objetivo: Este estudio examinó la asociación entre el ciberabuso en las relaciones de pareja (*cyber dating abuse*, CDA), los rasgos de personalidad de la tríada oscura, la soledad y la hostilidad, así como el papel moderador de variables sociodemográficas (p. ej., sexo y edad) y variables psicosociales (soledad y hostilidad) en la relación entre los rasgos de la tríada oscura y el CDA. **Método:** Se empleó un diseño cuantitativo transversal con una muestra de 603 participantes portugueses. Se administraron los siguientes instrumentos: un cuestionario sociodemográfico, el *Cyber Dating Abuse Questionnaire*, el *Dirty Dozen*, la subescala de Hostilidad del *Brief Symptom Inventory* y la versión abreviada de la *UCLA Loneliness Scale*. **Resultados:** Los hallazgos indicaron una elevada prevalencia de CDA, con un 20,3 % de los participantes que informaron conductas de perpetración. Los rasgos de la tríada oscura, la hostilidad y la soledad se asociaron significativamente tanto con la victimización como con la perpetración. Los análisis de moderación mostraron que la soledad y el uso de redes sociales moderaron la relación entre los rasgos de la tríada oscura y el CDA. **Conclusiones:** Aunque víctimas y perpetradores compartían diversas características psicosociales, los perpetradores se caracterizaron por informar con mayor frecuencia la participación en relaciones no comprometidas de duración superior a un año y por presentar niveles más elevados de soledad.

Palabras clave: Ciberabuso en el noviazgo; tríada oscura; hostilidad; soledad.

Received: August 4, 2025; Accepted: March 3, 2026.
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Acknowledgments: This work was supported by the Fundação para a Ciência e a Tecnologia, IP (FCT) under the multi-year funding awarded to CIIE [grants no. UIDB/00167/2020 and UIDP/00167/2020].

Introduction

Recently, terms such as *electronic dating violence* and *digital dating abuse* have emerged to describe violence in online dating contexts. However, *cyber dating abuse* (CDA) is the internationally recognized term for this type of abuse (Caridade et al., 2019; Cavalcanti & Coutinho, 2019). It is a construct that encompasses various abusive behaviors, such as threats, insults, humiliation, controlling behaviors, defamation, unauthorized sharing of photos or videos, and the sending of threatening messages or emails. This abuse can occur quickly, persistently, and in any context, even after the relationship has ended (Branson & March, 2021; Caridade & Braga, 2019; Cavalcanti & Coutinho, 2019). In this way, CDA is described as a multidimensional construct that encompasses various abusive typologies, including control aggression and direct aggression (Caridade & Braga, 2019). Control aggression involves psychological and behavioral control or monitoring, such as checking a partner's social media without permission (Gámez-Guadix et al., 2018). Direct aggression includes physical and verbal aggression, as well as online psychological, verbal, or moral harassment (Borrajo et al., 2015; Cavalcanti & Coutinho, 2019). CDA occurs swiftly, easily, and persistently, irrespective of the relationship's status, as the physical presence of the aggressor is not required (Cavalcanti & Coutinho, 2019). CDA involves the perpetration of various abusive behaviors through digital interactions (Caridade & Braga, 2019). These behaviors include daily control and surveillance, sending threatening emails or messages, defamation, unauthorized sharing of media, and unauthorized use of passwords (Branson & March, 2021; Caridade & Braga, 2019; Van Ouytsel et al., 2016).

The prevalence of CDA varies widely across studies, mainly due to differences in CDA definitions, the abuse typologies considered, distinctions between victimization and perpetration, sample characteristics, measurement instruments, and cultural contexts (Bennet et al., 2011; Caridade & Braga, 2019; Morrelli et al., 2017; Van Ouytsel et al., 2016; Watkins et al., 2016; Zweig et al., 2014). Despite these variations, studies report victimization rates ranging from 5.8% to 92% and perpetration rates from 6% to 91%, with control perpetration ranging from 49.6% to 88% and direct aggression perpetration ranging from 10.6% to 14.7% and victimization by online control ranges from 65% to 81%, and by direct aggression from 14% to 31.7% (Bennet et al., 2011; Caridade & Braga, 2019; Morrelli et al., 2017; Van Ouytsel et al., 2016; Watkins et al., 2016; Zweig et al., 2014). These findings suggest that, although the phenomenon is relatively common, its magnitude depends on the methodological framework adopted, highlighting the importance of understanding individual and relational factors that may influence engagement in abusive online behaviors. Among these factors, sociodemographic variables (such as gender, age, and educational level) and online time may constitute a particularly relevant dimension in this context.

In exploring CDA, gender has emerged as a focal point in research, yet consensus among scholars remains elusive (Cavalcanti & Coutinho, 2019). While some studies suggest similar victimization and perpetration rates across genders (Peskin et al., 2017; Van Ouytsel et al., 2016; Van Ouytsel et al., 2017), others indicate a higher prevalence of CDA victimization among females (Deans & Bhogal, 2017; Hérbert et al., 2017; Rivas et al., 2023; Zweig et al., 2014), with females exhibiting lower propensities toward perpetrating CDA (Cavalcanti & Coutinho, 2019; Deans & Bhogal, 2017; Pineda et al., 2021). Research indicates a nuanced pattern in the types of CDA perpetration associated with gender. Females are more inclined toward control behaviors, while males exhibit a higher propensity for direct aggression in perpetration (Bitsola & Kyranides, 2021; Cavalcanti & Coutinho, 2019; Deans & Bhogal, 2017).

Age is another variable of interest in the study of CDA (Smith et al., 2018). Research suggests that younger individuals, particularly students, are more likely to be involved in CDA in CDA attitudes compared to older age groups (Smith et al., 2018; Watkins et al., 2016). This trend may stem from younger individuals' greater proficiency with social media and technology, as well as their idealistic views of romantic relationships, which may lead to attempts to control and monitor their partners as expressions of affection (Cavalcanti & Coutinho, 2019; Watkins et al., 2016).

Social media use is closely associated with CDA, particularly among individuals who depend heavily on technology for social interactions (Zweig et al., 2014). Research consistently shows that increased time spent on social media is linked to higher rates of both CDA victimization and perpetration (Cavalcanti & Coutinho, 2019; Monteiro et al., 2023; Van Ouytsel et al., 2016; Van Ouytsel et al., 2017). Simply put, extensive use of social media or other types of technology provides individuals with greater insight into their partner's life, potentially triggering jealousy and leading to CDA behaviors aimed at exerting control (Cavalcanti & Coutinho, 2019; Storey & Pina, 2025; Van Ouytsel et al., 2016). CDA appears to be more prevalent in long-term, committed romantic relationships (Cavalcanti & Coutinho, 2019). Data from the Pew Research Center (2013) indicate that 10% of

adults (married or in a relationship) have shared sexually explicit photos or videos with their partner, potentially increasing vulnerability to future CDA victimization (Cavalcanti & Coutinho, 2019). Engagement in sexualized digital behaviors, such as sexting, constitutes a complex phenomenon influenced by multiple risk factors, including low self-control, higher sexual activity, prior victimization experiences, and difficulties in emotional regulation (Marcum et al., 2022; Pineda et al., 2023). These factors may contribute to greater exposure to abusive dynamics in digitally mediated intimate relationships. In this regard, Zweig et al. (2014) found that young people in committed relationships had already experienced CDA. Additionally, the duration of the relationship has been associated with increases in both perpetration and victimization of CDA, with longer relationships tending to show higher rates of abuse (Cava et al., 2020; Van Ouytsel et al., 2016). However, recent research indicates that technology-facilitated abuse can occur even outside of long-term or committed relationships, and may continue after the end of a romantic relationship, as physical proximity is not required for perpetration (Kim & Ferraresso, 2023; Storey & Pina, 2025).Given the relevance of individual factors in understanding CDA, it is pertinent to consider the dark triad traits as potential risk factors that increase the likelihood of victimization and perpetration, thereby establishing a clear link between personal characteristics and aggressive behaviors (Ugarte & Tapia, 2022). According to the General Aggression Model (GAM; Anderson & Bushman, 2002), aggression results from an interaction process involving situational and individual inputs, internal trajectories, and appraisal and decision-making processes. In this context, aggressive and hostile personality traits influence individuals' internal states, including emotions and cognitions, potentially leading to aggressive responses (Anderson & Bushman, 2018). Thus, dark triad traits (Machiavellianism, narcissism, and psychopathy) and hostility have been extensively studied as relevant individual factors for understanding aggressive behaviors associated with CDA (Costa et al., 2021; Palma et al., 2020).

Elevated scores in the Dirty Dozen of personality traits (Machiavellianism, narcissism, and psychopathy) have been linked to increased engagement in CDA (Bhogal & Wallace, 2021; Costa et al., 2021; Webster et al., 2016; Pineda et al., 2021). Webster et al. (2016) observed that higher scores in the dirty dozen were associated with heightened levels of aggression toward partners. (Webster et al., 2016). Several authors recommend a comprehensive investigation of dark personality traits, as they share common characteristics despite their distinctiveness (Palma et al., 2020).

Machiavellianism is characterized by using manipulation as a means to achieve goals, accompanied by a lack of empathy and traits of cynicism, deceitfulness, and insensitivity (Bhogal & Wallace, 2021; Pineda et al., 2021). Narcissism involves a belief in superiority, a need for dominance, selfishness, and a lack of empathy, resulting in self-centeredness and exaggerated self-perceptions (Palma et al., 2020). Finally, psychopathy is characterized by emotional insensitivity, impulsivity, antisocial behaviors, and a lack of guilt and empathy, leading to a manipulative and conflicted personality with a strong propensity for aggression (Muris et al., 2020).

Several investigations identify psychopathy as the personality trait most strongly associated with CDA, particularly through engagement in aggressive behaviors (Iyican & Babcock, 2018; Tetreault et al., 2018; Webster et al., 2016). This association can be explained by the core traits of psychopathy, as the combination of impulsivity, lack of empathy, and antisocial tendencies, along with deriving satisfaction from others' suffering, may increase the likelihood of engaging in abusive behaviors within intimate relationships (Azeredo et al., 2025). Additionally, the online environment can exacerbate these tendencies by lowering social inhibitions and enabling more immediate and persistent expressions of aggression, thereby contributing to the perpetration of CDA (Pineda et al., 2023).

Regarding narcissism, multiple authors argue for a direct correlation between narcissistic traits and the perpetration of CDA, especially in the form of control (Bhogal & Wallace, 2021; Talbot et al., 2015; Tetreault et al., 2018; Webster et al., 2016). Individuals with narcissistic characteristics often perpetrate CDA, driven by a sense of entitlement to regulate or dominate their partners' behavior (Oliver et al., 2023; Raskin & Hall, 1981; Talbot et al., 2015). This link between narcissism and CDA is reinforced by the online environment, which facilitates inappropriate relational behaviors such as aggression and grandiosity, consistent with narcissistic traits (Bhogal & Wallace, 2021; Pineda et al., 2021; Valachová & Lisá, 2024).

In turn, Machiavellianism has been primarily associated with emotional and psychological control behaviors in CDA, without showing consistent links to direct aggression (Brewer et al., 2018). Unlike the other dark triad traits, Machiavellianism appears as the only trait simultaneously associated with both perpetration and victimization of CDA (March et al., 2020; Pineda et al., 2021). This relationship can be understood considering the strategic and manipulative nature of this trait, which finds in the online context a favourable environment for monitoring, influencing, and indirectly

controlling the partner (White et al., 2024). At the same time, the visible and recordable nature of digital interactions may increase the likelihood that these behaviors are detected and, consequently, turned against the individual, contributing to their risk of victimization in CDA contexts (Pineda et al., 2023).

Literature emphasizes hostility as a variable contributing to understanding CDA, aligning with aggressive conduct (Cavalcanti & Pimentel, 2016). Hostility encompasses affect, expressive behavior, and negative attitudes, including cynicism, distrust, and defamation (Deans & Bhogal, 2017). Defined as a negative attitude toward others, hostility involves antipathy and aggressive behaviors (Eckhardt et al., 2004; Berkowitz, 1993). Overall, hostility signifies a cognitive trait marked by devaluation and opposition (Deans & Bhogal, 2017; Eckhardt et al., 2004; Zweig et al., 2014). Deans & Bhogal (2017) found that hostility predicts CDA perpetration, as higher hostility and anger scores correlate with cyber abuse (Zweig et al., 2014). This aligns with Zweig et al. (2014), who linked hostile relationships to relational aggression, a common feature of CDA (Branson & March, 2021; Zweig et al., 2014).

Loneliness may contribute to both victimization and perpetration of CDA. Prior studies have associated loneliness with victimization in traditional offline dating violence (Cava et al., 2018). Perpetrators often seek to isolate victims socially to exert control (Muñiz Rivas et al., 2015). Loneliness involves a discrepancy between desired and actual social relationships, with two main facets: social loneliness, a negative feeling of lacking social support, and emotional loneliness, characterized by the absence of desired companionship (Valtorta & Hanratty, 2012).

In a study by Cava et al. (2020), higher levels of loneliness were associated with increased susceptibility to CDA victimization. Loneliness led individuals to seek solace in romantic relationships, making them less vigilant to potential abusive behaviors from partners. Similarly, victims of CDA often report feeling lonelier and experiencing elevated levels of loneliness compared to non-victims (Matthews et al., 2020; Muñiz et al., 2015; Rivas et al., 2023). Conversely, victims may also experience increased isolation when their online relationships are controlled by partners. Thus, loneliness is not only a risk factor for CDA victimization but also a consequence of such victimization (Cava et al., 2020).

Existing research predominantly focuses on CDA among young individuals, leaving a gap in studies examining the broader population. Furthermore, there is a lack of consensus in the literature regarding the variables investigated, highlighting the need for additional studies to fully understand the relationship between CDA and various factors.

Consequently, this study's primary aim is to investigate the moderating impact of sociodemographic, relational, and psychological variables (specifically, hostility and loneliness) on the connection between the dark triad of personality and CDA. Specifically, the study seeks to examine the frequency of CDA, explore variations in victimization and perpetration according to sociodemographic, relational, and internet/social media use factors, investigate associations between CDA, the dark triad, hostility, and loneliness, and identify moderating variables in the relationship between the Dirty Dozen and CDA.

To address these aims, the following research questions are posed: 1) Will sociodemographic variables (including gender, age, education, and living arrangements) act as moderators in the association between the dirty dozen and both CDA victimization and perpetration?; 2) Are relational variables (specifically, relationship status, nature of the relationship, and relationship duration) likely to moderate the link between the dirty dozen and CDA victimization and perpetration?; 3) Do variables pertaining to internet usage, such as engagement with social networks and the amount of time spent online for leisure, exhibit a moderating effect on the relationship between the dirty dozen and CDA victimization and perpetration?; 4) Can it be assumed that psychological variables, namely hostility and loneliness, will act as moderators in the relationship between the dirty dozen and CDA victimization and perpetration?

Based on these objectives and questions, the following hypotheses were proposed:1) Prevalence of CDA: The prevalence of cyber dating abuse (both perpetration and victimization) will exceed 6%; 2**)** Gender Differences in CDA: Females are expected to report higher levels of victimization, while males are expected to report higher levels of perpetration. Women are expected to engage more in controlling behaviors, whereas men are expected to engage more in direct aggression. 3) Age, Student Status, and Relationship Characteristics: Younger individuals and students are expected to exhibit higher levels of CDA, particularly controlling behaviors. Individuals in longer and committed romantic relationships are expected to report higher levels of both victimization and perpetration. 4) Internet Use: Higher time spent online for leisure purposes is expected to be associated with higher levels of CDA. 5) Correlations with Dark Triad, Hostility, and Loneliness: CDA (perpetration and victimization) is expected to be positively correlated with dark triad traits, hostility, and loneliness. Specifically, Machiavellian

traits are expected to relate to controlling perpetration and victimization through direct aggression; narcissistic traits to control perpetration; psychopathic traits to direct aggression perpetration; and high hostility to higher perpetration levels. Victims of CDA are expected to report higher levels of loneliness.

Methods

Participants

Data was collected through online questionnaires, ensuring accessibility and ease of participation. A convenience sample was used, meaning that participants were selected based on their availability and willingness to participate, after applying the exclusion criteria, which included being under 18 years of age, not being a Portuguese speaker, and declining to participate in the study. This approach allowed for efficient data collection. The final sample consisted of 603 participants with an average age of approximately 30 years, mostly female. Most participants had academic qualifications, were not students, and did not live alone. A significant portion had been in a committed romantic relationship for over three years. Among those not currently in a relationship, 75 were in one during the past year. Most participants used social media and the internet for non-professional or academic purposes, spending between three to six hours per day online (Table 1).

Procedure

The study protocol, developed in accordance with the latest version of the Helsinki Declaration (2013), included a sociodemographic questionnaire and selected instruments. The study was approved by the Ethics Committee of the University of Trás-os-Montes and Alto Douro (Doc68-CE-UTAD-2022). Prior to participation, all participants provided signed informed consent, which explained the purpose of the study and ensured that all information would be used solely for research purposes. Calls for participation were disseminated via social media and other online platforms. The survey was self-administered and asynchronous, meaning researchers were not present during its completion. Participants had to be over 18 years old, Portuguese-speaking, and provide informed consent to take part in the study. The questionnaires were anonymous, although the researcher's email was provided for questions or clarifications. Data collection occurred over approximately six months. All instruments used were authorized by their original authors. A total of 603 participants met the inclusion criteria and completed the survey. Ethical procedures were upheld throughout the study, ensuring participant confidentiality, anonymity, and voluntary participation.

Instruments

The Sociodemographic Questionnaire was designed to collect descriptive information to characterize the sample and examine associations with cyber dating abuse (CDA). It consisted of 12 items divided into three sections. The first section included six demographic questions on gender, age, educational qualifications, occupation, living situation, and number of people with whom you live. The second section included four questions on romantic relationships, such as current relationship status, single status, the duration of the last relationship, and relationship type (committed or non-committed). The third section contained two questions regarding internet use, asking whether participants regularly use social media or the internet, and the number of hours per day spent online for non-academic or non-professional purposes. Responses were primarily categorical or open-ended, with numerical responses where appropriate. The questionnaire was self-administered and anonymous.

The Cyber Dating Abuse Questionnaire (CDAQ; Borrajo, et al., 2015) was used to assess CDA within romantic relationships. The Portuguese version of the instrument (Caridade & Braga, 2019) was employed. This version is comprised of 40 items divided into two dimensions (victimization and perpetration) and two subscales (direct aggression and control). Twenty items measure victimization (e.g., "My partner or ex-partner has written a comment on social media to insult or humiliate me") and 20 items measure perpetration (e.g., "I have written a comment on social media to insult or humiliate my partner or ex-partner"). Items are answered using a 6-point Likert scale (1 = Never; 2 = No, in the last year; 3 = Rarely; 4 = Sometimes; 5 = Frequently; 6 = Many times). Higher scores indicate greater involvement in CDA behaviors. Reliability results were $\alpha = 0.86$ for victimization – direct aggression, $\alpha = 0.91$ for victimization – control, $\alpha = 0.89$ for perpetration – direct aggression, and $\alpha = 0.84$ for perpetration – control, indicating good reliability levels.

The Dark Triad Dirty Dozen (DTDD**;** Jonason & Webster, 2010) was used to assess three social dimensions of personality: narcissism, Machiavellianism, and psychopathy. The Portuguese version of the scale (Macedo et al., 2017) was employed. This scale consists of 12 items, with four items per factor. Respondents select

Table 1. Sociodemographic and romantic relationship characteristics of the total sample (N = 603)

Sociodemographics		***M* ± *SD***
Age	Total	29.88 (11.59)
		***n* (%)**
Sex	Man	118 (19.6)
	Woman	485 (80.4)
Education	No university studies	288 (47.8)
	With university studies	315 (52.2)
Professional occupation	Students	261 (43.3)
	Non-students	342 (56.7)
Do you live alone?	No	557 (92.4)
	Yes	46 (7.6)
If not, how many people do you live with?	Not applicable	42 (7.0)
	1 to 2 people	260 (43.1)
	3 to 4 people	259 (43.0)
	5 to 6 people	37 (6.1)
	More than 7 people	5 (0.8)
Romantic relationship		***n* (%)**
Relational situation	I find myself in a loving relationship	384 (63.7)
	I'm not in a loving relationship	219 (36.3)
Duration of the relationship	Less than 1 year	51 (8.5)
	Between 1 and 3 years	76 (12.6)
	More than 3 years	257 (42.6)
If you're not currently in a relationship, have you been in a relationship for less than a year?	No	144 (23.9)
	Yes	75 (12.4)
Nature of the relationship	I'm not in a relationship	184 (30.5)
	No commitment	49 (8.1)
	With commitment	370 (61.4)
Social media		***n* (%)**
Do you usually use social media/internet?	No	12 (2.0)
	Yes	591 (98.0)
How many hours a day do you spend on the internet/social media for leisure purposes?	0 to 2 hours	218 (36.2)
	3 to 6 hours	329 (54.6)
	7 to 10 hours	45 (7.5)
	More than 10 hours	11 (1.8)

Note. n = Frequencies; % = percentage; M = media; SD = standard deviation.

their level of agreement using a 5-point Likert scale (1 = strongly disagree to 5 = strongly agree). Higher scores indicate greater identification with the traits. Reliability results were α = 0.72 for the total scale, α = 0.74 for the narcissism factor, α = 0.64 for the psychopathy factor, and α = 0.73 for the Machiavellianism factor, indicating acceptable reliability levels.

The Hostility subscale of the Brief Symptom Inventory (BSI; Derogatis, 1982) was used to assess thoughts, emotions, and behaviors characteristic of negative affective states. The Portuguese version of the instrument (Canavarro, 1999) was employed. This subscale comprises five items, which can be used independently. Items are rated on a 5-point Likert scale

(0 = Never; 1 = Few Times; 2 = Sometimes; 3 = Often; 4 = Very Often), with higher scores indicating greater levels of hostility. Reliability results were α = 0.76, indicating good psychometric properties.

The UCLA Loneliness Scale Short Form (ULS-6; Russell, 1996) was used to assess perceived social isolation. The Portuguese version of the instrument (Neto, 2014) was employed. This unifactorial scale consists of six items. Participants indicate the degree to which each item reflects their feelings using a 4-point Likert scale (1 = Never; 2 = Rarely; 3 = Sometimes; 4 = Often). Higher scores indicate greater feelings of loneliness. Reliability results were α = 0.82, indicating good psychometric properties.

Statistical Analyses

Data was processed using SPSS version 28 and PROCESS version 4.2. First, prevalence rates of CDA were examined. To this end, the mean CDA scores were recoded into a binary variable, distinguishing between individuals who never (= 1) perpetrated or experienced any of the measured CDA behaviors and those who perpetrated or experienced at least one of the CDA behaviors at least once (= 2). In subsequent analyses, CDA perpetration and victimization were treated as continuous variables. Descriptive statistics (mean, mode, maximum, minimum) and univariate normality (skewness and kurtosis) were assessed. Internal consistency was measured using Cronbach's alpha (α) to evaluate the reliability of the instruments used (Marôco, 2014). Pearson's correlation coefficient (r) and Spearman's rho (ρ) were used to examine correlations between variables. Multiple linear regressions were performed, conducted separately to identify the distinct sets of variables that contribute to explaining variance in cyber dating abuse victimization and perpetration. Prior to performing the regression analyses, all relevant statistical assumptions (including linearity, homoscedasticity, independence of residuals, and absence of multicollinearity) were tested and met. The predictor variables entered into the models were selected based on their preliminary bivariate correlations with the dependent variables. Predictors that demonstrated a significant correlation with either victimization or perpetration were retained for the respective regression model, while those showing no significant association were excluded. This approach ensured that the final models were both parsimonious and theoretically grounded, focusing only on factors with an initial empirical link to the outcomes of interest. Moderation analyses were performed to determine which variables moderated the relationship between the dark triad and CDA. The moderation analyses conducted in this study are grounded in the assumption that the relationship between the dark triad of personality and CDA is not homogeneous, but rather contingent upon individual, relational, contextual, and psychological characteristics. Accordingly, sociodemographic and relational variables may shape this association, while internet and social media use represents a specific facilitating context for the expression of abusive behaviors. Furthermore, psychological states such as hostility and loneliness may intensify the extent to which dark triad traits are translated into CDA behaviors, thereby justifying their inclusion as moderating variables and contributing to a more contextualized and theoretically informed understanding of these associations. All analyses were conducted at $p < 0.05$.

Results

Descriptive statistics (mean, standard deviation, minimum, and maximum) were calculated for the items from the instruments used in this study. Skewness and kurtosis values were also calculated to assess the distribution of the items. All items with the exception of the items in the subscale victimization and perpetration by direct aggression, present values within the normative for the normal distribution (Kline, 2015). However, given the sample size, the use of parametric tests was chosen (Sangthong, 2020) (Annex 1- Table A1.)

Table 2 presents the description of mean values, standard deviation, and Cronbach's alpha for the total and sub-scales of this study. All totals (CDA, dirty dozen, hostility, and loneliness) and all sub-scales of CDA (victimization, victimization by control, victimization by direct aggression, perpetration, perpetration by control, and perpetration by direct aggression) and the dirty dozen (narcissism and Machiavellianism) have Cronbach's alpha values within the cutoff point (α ≥ 0.70), except for the sub-scale psychopathy (dirty dozen), whose value is slightly below (Marôco, 2014).

The prevalence of the construct was calculated; the victimization of CDA showed a prevalence of 21.5%, the perpetration of CDA had a prevalence of 20.3%, victimization of CDA by control and by direct aggression had a prevalence of 24.7% and 19%, respectively, the prevalence of perpetration by control was 23.7%, and the perpetration of CDA by direct aggression was 17.5%.

Table 3 shows the correlations between all dimensions of this study. Most variables are positively and significantly correlated with each other. The most significant correlations are found between the total dirty

Table 2. Description of mean values, standard deviation, and Cronbach's alpha

	M	*SD*	α
Cyber Dating Abuse			
Total	1.26	0.43	0.94
Victimization	1.29	0.58	0.93
Victimization Control	1.48	0.86	0.92
Victimization Direct Aggression	1.14	0.46	0.90
Perpetration	1.22	0.37	0.87
Perpetration Control	1.42	0.66	0.87
Perpetration Direct Aggression	1.05	0.23	0.85
Dirty Dozen			
Total	2.09	0.62	0.82
Narcissism	2.42	0.87	0.80
Psychopathy	2.07	0.73	0.61
Machiavellianism	1.77	0.81	0.82
Hostility			
Total	0.97	0.68	0.81
UCLA Loneliness Scale (ULS-6)			
Total	2.13	0.70	0.85

Note. M = media; *SD* = standard deviation; α = alfa de Cronbach.

Table 3. Correlations between scales and subscales

	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
1. CDA Victimization	1											
2. CDA Victimization Control	.95**	1										
3. CDA Victimization Direct Aggression	.87**	.67**	1									
4. CDA Perpetration	.59**	.60**	.46**	1								
5. CDA Perpetration Control	.54**	.60**	.33**	.95**	1							
6. CDA Perpetration Direct Aggression	.49**	.37**	.57**	.71**	.47**	1						
7. Total Dirty Dozen	.10*	.10*	.08*	.21**	.16**	.25**	1					
8. Narcissism	.11**	.11**	.10*	.19**	.16**	.19**	.73**	1				
9. Psychopathy	.05	.06	.04	.11**	.06	.17**	.74**	.24**	1			
10. Machiavellianism	.06	.06	.05	.18**	.14**	.22**	.83**	.39**	.53**	1		
11. Hostility	.20**	.20**	.15**	.36**	.30**	.32**	.41**	.27**	.28**	.39**	1	
12. Loneliness	.14*[a]	.14**	.11**	.18**	.17**	.15**	.20**	.14**	.11**	.20**	.35**	1

Note. **p* < .005; ***p* < .001.

dozen, narcissism, psychopathy, Machiavellianism, hostility, and loneliness with the total perpetration and direct aggression of CDA. However, the psychopathy and Machiavellianism variables of the dirty dozen scale do not correlate with the victimization factor (total, control, and direct aggression) of the CDA scale. The perpetration by control sub-scale of the CDA scale also does not correlate with the psychopathy sub-scale of the dirty dozen.

To verify the predictive role of other variables in the study concerning CDA, a linear regression analysis was conducted. The assumption of linearity receives preliminary support from the statistically significant positive bivariate correlations between the dependent variables and the predictors ($p < .001$). The assumption of independence of errors is strongly supported by the Durbin-Watson statistic of 2.061 for the final models. This

value, very close to the ideal of 2, indicates no significant autocorrelation among the residuals. Homoscedasticity (constant variance of residuals) can be partially inferred from the consistent standard error of the estimate across the nested models (~0.399) and the lack of extreme fluctuations in residual statistics. The assumption of normality of residuals is tentatively supported by the residual statistics, where the mean residual is 0.000 and the standard deviation is 0.397, suggesting a symmetrical distribution. Finally, multicollinearity is not a concern. All Variance Inflation Factor (VIF) values in the final models are very low (ranging from 1.020 to 1.212), well below the common threshold of 5 or 10, confirming that the predictor variables are not highly correlated with each other.

The following tables provide a detailed overview of the variables contributing to the explanation of CDA (Victimization and Perpetration). After analyzing all the variables in the study and adjusting the models, all models showed reasonable fit, except for the Victimization by direct aggression (Table 6), which exhibited a poor fit. Thus, Table 4 presents the variables contributing to the explanation of 12% of the variance in CDA victimization, and Table 5 shows the variables explaining 14% of the variance in victimization by control of CDA. Finally, Table 7 displays the variables contributing to the explanation of 20% of the variance in CDA perpetration. Tables 8 and 9, respectively, show the explanatory variables for 20% and 14% of the perpetration by control and direct aggression.

Table 4. Explanatory variables of CDA victimization

	Model 1			Model 2			Model 3		
	B	*EP B*	*β*	*B*	*EP B*	*β*	*B*	*EP B*	*β*
Hostility	.168	.058	.192	.176	.056	.202	.171	.055	.196
Professional occupation				.346	.088	.254	.340	.087	.249
Recent previous relationship (less than a year)							.244	.088	.177
R^2 (R^2 *Adj.*)		.037 (.033)			.101 (.093)			.132 (.120)	
F for change in R^2								.031^{ns}	

Note. R^2 = R squared; R^2 *Adj.* = Adjusted R squared; *B* = Non-standard regression coefficients; *EP B* = non-standard B error; *β* = standardized regression coefficients; *ns* = not significant.

Table 5. Explanatory variables of Control Victimization

	Model 1			Model 2			Model 3		
	B	*EP B*	*β*	*B*	*EP B*	*β*	*B*	*EP B*	*β*
Professional occupation	.509	.134	.249	.498	.131	.243	.514	.129	.251
Recent previous relationship (less than a year)				.452	.132	.219	.438	.130	.212
Hostility							.251	.082	.193
R^2 (R^2 *Adj.*)		.062 (.058)			.110 (.102)			.147 (.135)	
F for change in R^2								.037*	

Note. R^2 = R squared; R^2 *Adj.* = Adjusted R squared; *B* = Non-standard regression coefficients; *EP B* = non-standard B error; *β* = standardized regression coefficients; *$p < .005$.

Table 6. Explanatory variables of Victimization by Direct Aggression

	Model 1			Model 2			Model 3		
	B	*EP B*	*β*	*B*	*EP B*	*β*	*B*	*EP B*	*β*
Professional occupation	.035	.037	.038	.074	.039	.081	.079	.039	.086
Nature of the relationship				-.068	.021	-.135	-.062	.021	-.123
Hostility							.098	.027	.146
R^2 (R^2 *Adj.*)		.001(.000)			.018 (.014)			.039 (.034)	
F for change in R^2								.021**	

Note. R^2 = R squared; R^2 *Adj.* = Adjusted R squared; *B* = Non-standard regression coefficients; *EP B* = non-standard B error; *β* = standardized regression coefficients; **$p < .001$.

Table 7. Explanatory variables of perpetration of CDA

	Model 1			Model 2			Model 3		
	B	*EP B*	*β*	*B*	*EP B*	*β*	*B*	*EP B*	*β*
Professional occupation	.143	.034	.273	.140	.034	.266	.149	.032	.285
Recent previous relationship (less than a year)				.129	.047	.178	.120	.044	.166
Hostility							.150	.028	.329
R^2 (R^2 *Adj.*)		.074 (.070)			.106 (.098)			.214 (.203)	
F for change in R^2								.108**	

Note. R^2 = R squared; R^2 *Adj.* = Adjusted R squared; *B* = Non-standard regression coefficients; *EP B* = non-standard B error; *β* = standardized regression coefficients; **$p < .001$.

Table 8. Explanatory variables of perpetration by control

	Model 1			Model 2			Model 3		
	B	*EP B*	*β*	*B*	*EP B*	*β*	*B*	*EP B*	*β*
Sex	-.228	.090	-.162	-.200	.089	-.142	-.188	.086	-.133
Professional occupation	.275	.060	.293	.270	.059	.288	.284	.057	.303
Recent previous relationship (less than a year)				.229	.082	.177	.217	.079	.168
Hostility							.222	.050	.271
R^2 (R^2 *Adj.*)		.116 (.108)			.147 (.135)			.220 (.205)	
F for change in R^2								20.06**	

Note. R^2 = R squared; R^2 *Adj.* = Adjusted R squared; *B* = Non-standard regression coefficients; *EP B* = non-standard B error; *β* = standardized regression coefficients; **$p < .001$.

Table 9. Explanatory variables of perpetration by direct aggression

	Model 1			Model 2			Model 3		
	B	*EP B*	*β*	*B*	*EP B*	*β*	*B*	*EP B*	*β*
Professional occupation	.049	.014	.137	.058	.015	.163	.058	.014	.164
Relational Situation				-.167	.057	-.345	-.145	.054	-.299
Nature of the relationship				-.118	.030	-.460	-.098	.029	-.380
Narcissism							.028	.011	.104
Hostility							.096	.013	.283
R^2 (R^2 *Adj.*)		.019 (.017)			.050 (.045)			.155 (.148)	
F for change in R^2								37,29**	

Note. R^2 = R squared; R^2 *Adj.* = Adjusted R squared; *B* = Non-standard regression coefficients; *EP B* = non-standard B error; *β* = standardized regression coefficients; **$p < .001$.

Table 10 presents the moderator variables in the relationship between the dirty dozen and CDA (victimization and perpetration). Thus, gender, age, educational qualifications, living alone, relationship status, use of social networks, number of hours spent on social networks for leisure, and hostility moderate the relationship between CDA victimization and the dirty dozen. Therefore, being female, aged 27 years or older, lacking university education, living alone, being in a romantic relationship, not using social networks, spending more than three hours per day on the internet for leisure, and having higher levels of hostility make the relationship between CDA victimization and the dirty dozen significant. In turn, the variables; gender, age, educational qualifications, living alone, relationship status, nature of the relationship, relationship duration, hours on the internet, hostility, and loneliness moderate the relationship between CDA perpetration and the dirty dozen. As a result, being female, aged 26 years or older, lacking university education, living alone, being in a

Table 10. Moderations in the relationship between the Dirty Dozen and CDA

Predictor	Moderator	Dependent	*F*(3, 599)	*p*	*β*	*95% CI*	*t*	*p*	Variance %	ΔR²	Moderator option	β	*p*
Dirty Dozen	Sex	Victimization	5.528	.001	-.186	-.371, -.002	−1.981	.048	2.7	.010	Woman	−.161	.000
“	Age	Victimization	6.891	.000	.008	.002, .013	2.693	.007	3.3	.012	≥27	.080	.050
“	Qualifications	Victimization	4.462	.004	-.168	-.319, -.017	-2.187	.029	2.2	.008	No university studies	.187	.001
“	Living alone	Victimization	7.829	.000	.353	.116, .590	2.922	.004	3.8	.014	Yes	.408	.001
“	Relational situation	Victimization	4.959	.002	-.202	-.358, -.046	-2.537	.011	2.4	.011	Being in a relationship	.167	.001
“	Use social media/internet	Victimization	17.152	.000	-1.213	-1.575, -.850	-6.574	.000	7.9	.066	No	1.256	.000
“	Social Media Hours	Victimization	9.500	.000	.211	.120, .301	4.568	.000	4.5	.033	More than 3 hours a day	.123	.002
“	Hostility	Victimization	17.221	.000	.212	.130, .295	5.060	.000	8.0	.040	High scores	.240	.000
“	Sex	Perpetration	18.741	.000	-.154	-.268, -.040	-2.645	.008	8.6	.011	Woman	.187	.000
“	Age	Perpetration	31.477	.000	.011	.007, .014	6.246	.000	13.6	.056	≥26	.087	.001
“	Qualifications	Perpetration	15.671	.000	-.197	-.291, .103	-4.124	.000	7.3	.026	No university studies	.233	.000
“	Living alone	Perpetration	23.416	.000	.440	.294, .585	5.914	.000	1.5	.052	Yes	.518	.000
“	Relational situation	Perpetration	13.496	.000	-.137	-.234, -.039	-2.749	.006	6.3	.012	Being in a relationship	.185	.000
“	Nature of the relationship	Perpetration	11.514	.000	-.053	-.104, -.002	-2.032	.043	5.5	.007	Relationship without commitment	.141	.000
“	Duration of the relationship	Perpetration	14.979	.000	.090	.000, .180	1.973	.049	1.6	.009	More than a year of relationship	.140	.001
“	Hours on the internet	Perpetration	27.400	.000	.194	.139, .249	6.870	.000	12.1	.069	More than an hour a day	.092	.000
“	Hostility	Perpetration	49.817	.000	.186	.137, .235	7.466	.000	2.0	.075	High scores	.085	.001
“	Loneliness	Perpetration	16.445	.000	.079	.019, .138	2.606	.009	7.6	.011	Feeling of greater loneliness	.097	.000

Note. F = F distribution*; p* = p-value*; β* = standardized beta*; CI* = confidence interval*; t* = t-test.

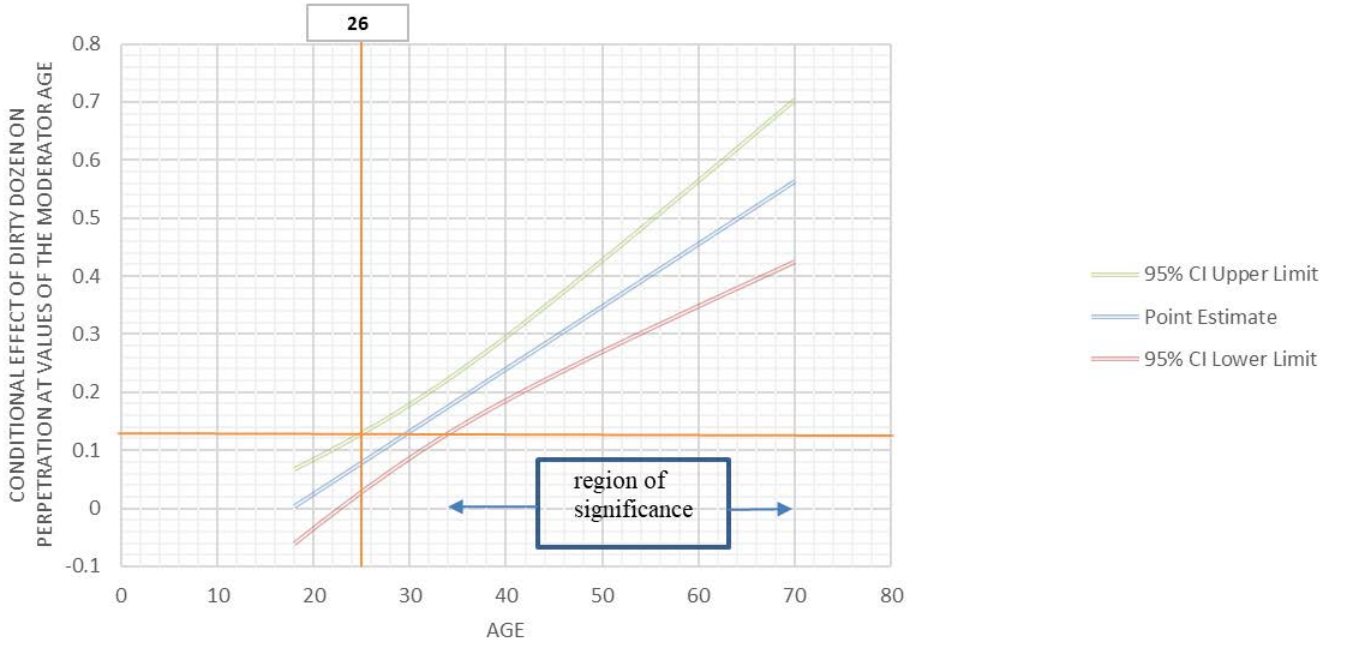

Figure 1. Moderation of age in the relationship between the Dirty Dozen and perpetration.

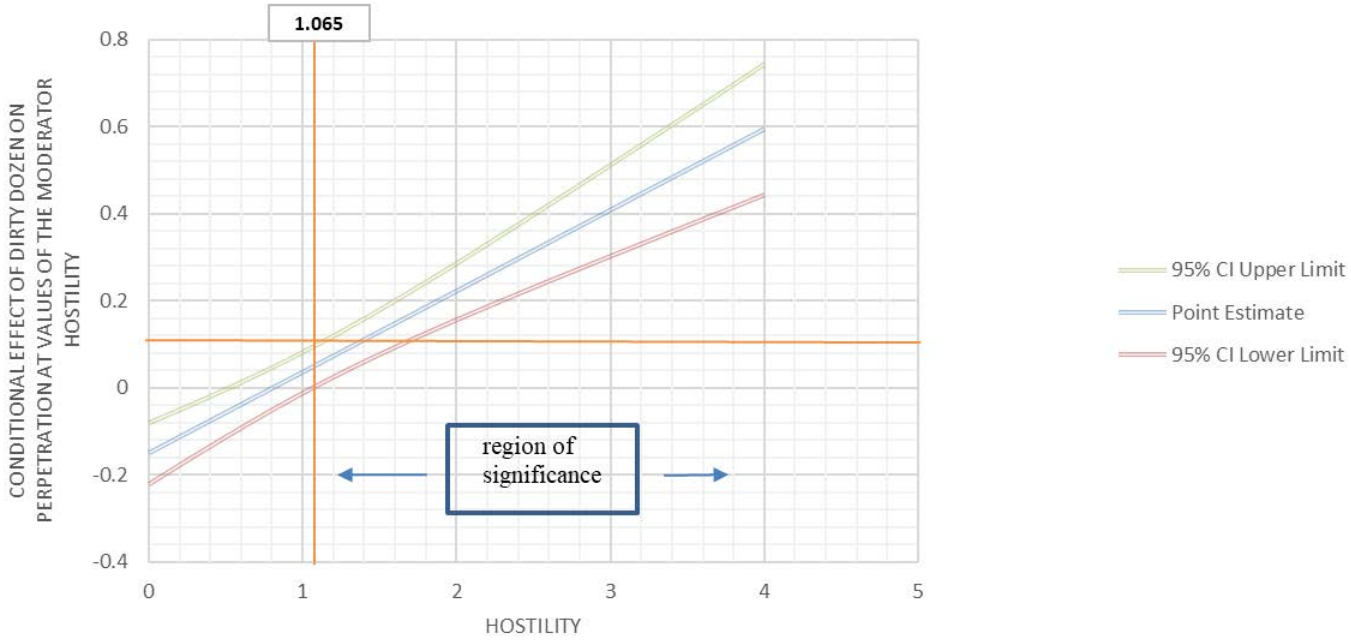

Figure 2. Moderation of hostility in the relationship between the Dirty Dozen and perpetration.

non-committed relationship, having a relationship of more than one year, spending more than one hour per day on the internet for leisure, having higher levels of hostility, and experiencing greater loneliness make the relationship between CDA perpetration and the dirty dozen significant (Figure 1 and Figure 2).

Discussion

In contemporary times, the internet serves as a remarkably adaptable and appealing environment for establishing various interpersonal connections, including romantic relationships (Cavalcanti & Coutinho, 2019). Existing literature has demonstrated the presence of diverse digital tools, such as text messages, social media

posts, video calls, and emails, designed to foster and sustain romantic relationships (Caridade et al., 2019). However, with the progression of technology, new forms of interpersonal aggression have emerged, notably CDA (Caridade et al., 2019; Cavalcanti & Coutinho, 2019; Storey & Pina, 2025). Therefore, this study primarily aims to evaluate the moderating influence of sociodemographic, relational, and psychological factors, including hostility and loneliness, on the association between the dark triad of personality and CDA. The specific objectives encompass (1) To explore the frequencies of CDA in order to contribute to the existing literature; (2) to investigate variations in CDA victimization and perpetration based on sociodemographic, relational, and internet and social media usage factors; (3) Establishing associations between CDA and the dark triad, hostility, and loneliness; (4) Pinpointing the variables that exert a moderating influence on the relationship between the dark triad of personality and CDA.

The initial hypothesis, aligned with the first objective, aimed to assess the prevalence of CDA within the sample. The findings confirmed that the prevalence of CDA (both victimization and perpetration) exceeded 6%, with the lowest identified prevalence being 17.5%, specifically associated with the perpetration of CDA in the form of direct aggression. These results find support in existing literature, where the prevalence of CDA victimization varies widely, ranging from 5.8% to 92%, and the prevalence of perpetration varies between 6% and 91% across different studies (Borrajo et al., 2015; Brown & Hegarty, 2018; Caridade & Braga, 2019; Morrelli et al., 2017; Van Ouytsel et al., 2017; Watkins et al., 2016; Zweig et al., 2014). This variability can be attributed to various factors, including the diversity of constructs employed (such as CDA, electronic violence in dating, abuse in digital dating), variations in sample characteristics (such as size), and discrepancies in the instruments utilized (Caridade et al., 2019). Nevertheless, the findings of the present study seem to reinforce the growing prevalence of this type of violence, which can be partly attributed to the increasing use of technology in intimate relationships. Digital tools enable partners to engage in controlling, monitoring, and abusive behaviors, a well-documented phenomenon in recent research on technology-facilitated intimate partner violence (Storey & Pina, 2025).

The subsequent hypotheses were formulated to address the second objective. In order to test these hypotheses, regression analyses were conducted. Overall, the regression analysis meets the critical assumptions of independence and absence of multicollinearity, with reasonable preliminary evidence supporting linearity and normality, though additional examination of residual plots would further strengthen these conclusions.

The results partially confirm that females exhibit higher values in CDA victimization, while males state higher values in CDA perpetration. The study revealed a significant association between being female and both victimization and perpetration of CDA when linked to the dark triad. These findings are consistent with existing literature, where various authors connect the female gender to CDA victimization (Deans & Bhogal, 2017; Hérbert et al., 2017; Rivas et al., 2023; Zweig et al., 2014). However, some authors do not emphasize distinctions between men and women in terms of CDA perpetration (Peskin et al., 2017; Van Ouytsel et al., 2016; Van Ouytsel et al., 2017). These outcomes may be explained by the predominant female composition of the sample.

The findings partially supported the notion that women demonstrate higher levels of perpetration in CDA, specifically in the form of control, while men exhibit greater scores in perpetration through direct aggression. Similarly, women tend to have higher values in victimization involving direct aggression, whereas men show elevated scores in victimization related to control. Notably, the results revealed significant differences between females and perpetration by control, suggesting that women are more prone to engaging in controlling behaviors compared to men. These outcomes align with existing literature highlighting controlling behaviors in CDA perpetrated by females (Cavalcanti & Coutinho, 2019; Deans & Bhogal, 2017). From a theoretical perspective, these patterns can be understood in light of gender socialization theory, which posits that women are more likely to engage in indirect and relational forms of aggression, such as controlling behaviors, surveillance, and emotional manipulation, whereas men are socialized to express aggression in a more direct and overt manner (Bitsola & Kyranides, 2021). On the contrary, no differences were identified between other sub-scales of CDA and gender, consistent with literature suggesting no significant gender-based differences in CDA behaviors (Peskin et al., 2017; Van Ouytsel et al., 2016; Van Ouytsel et al., 2017).

The hypothesis proposing that younger individuals and students would exhibit higher CDA scores, particularly in the form of control, was not substantiated, as no correlations were observed between younger ages and control-based CDA. However, age, when considered with the dark triad, displayed a significant association with CDA in both victimization and perpetration. The results indicated that older individuals manifested more behaviors related to victimization or perpetration. This

trend may be explained by the idea that personality traits, including those of the dirty dozen, become more entrenched in adulthood, leading to an increase in harmful behaviors during this life stage. Consequently, this finding contradicts existing literature, which suggests that younger individuals are more inclined to display CDA behaviors (Smith et al., 2018; Watkins et al., 2016).

The findings failed to validate the notion that individuals involved in longer, committed romantic relationships exhibit heightened levels of CDA, both in terms of victimization and perpetration. Within the multiple linear regression model elucidating perpetration and victimization through direct aggression, it was found that not being in a relationship or being in a relationship lacking commitment contributes to explaining the variance in perpetration and victimization by direct aggression. These results were further bolstered by moderation analyses, revealing that the victimization and perpetration of CDA, when correlated with the dark triad, exhibited significant associations with relationship status (lack of relationship) and relational dynamics (non-committed relationship). Such data do not align with existing literature suggesting that CDA tends to be more prevalent in committed, long-term romantic relationships (Cava et al., 2020; Van Ouytsel et al., 2016; Zweig et al., 2014). This phenomenon can be explained by the fact that technology-mediated violence does not require physical proximity, allowing abusive, controlling, and monitoring behaviors to persist or emerge even in the absence of a formal relationship (Branson & March, 2021; Caridade & Braga, 2019; Cavalcanti & Coutinho, 2019; Kim & Ferraresso, 2023).

The hypothesis suggesting that individuals who spend more leisure time on the internet demonstrate higher CDA scores was confirmed. The duration of internet use for leisure, when correlated with the dark triad, displayed a significant relationship with CDA (victimization and perpetration). This implies that individuals with darker personality traits who spend more hours on the internet for leisure are more likely to be victims or perpetrators of CDA. These results can be understood through models linking digital exposure and personality traits to the risk of abusive behavior. Prolonged use of digital platforms increases opportunities for contact, monitoring, and controlling interactions, particularly among individuals with manipulative, low-empathy, or aggressive traits, which are associated with higher likelihoods of CDA perpetration and victimization (Cavalcanti & Coutinho, 2019; Bhogal & Wallace, 2021; Pineda et al., 2021). Recent literature also highlights that digital tools facilitate control and abuse even in the absence of physical proximity or formal relationships (Storey & Pina, 2025). These findings are consistent with existing literature, which indicates that increased time on social media is associated with a higher likelihood of experiencing or perpetrating CDA (Cavalcanti & Coutinho, 2019; Van Ouytsel et al., 2016; Van Ouytsel et al., 2017).

The subsequent hypotheses aim to address objective three. The results confirmed the hypothesis that individuals with higher scores on the dirty dozen exhibit increased levels of CDA (victimization and perpetration). Significant correlations were identified between the dirty dozen and CDA (victimization and perpetration), consistent with existing literature. Several studies suggest that elevated scores on the dirty dozen personality traits are linked to a higher likelihood of engaging in CDA (Bhogal & Wallace, 2021; Webster et al., 2016; Pineda et al., 2021). This association can be theoretically explained by the fact that individuals with high scores on the "Dark Triad" tend to display manipulative behaviors, insensitivity to others' needs, and a propensity for control traits that facilitate both perpetration and victimization in CDA contexts. These personality traits appear to amplify the exploitation of digital opportunities to exert control or abuse a partner and increase the likelihood of engaging in risky interactions on digital platforms (Bhogal & Wallace, 2021; Webster et al., 2016; Pineda et al., 2021; Storey & Pina, 2025).

The hypothesis that individuals displaying Machiavellian traits would demonstrate higher scores in perpetrating CDA through control, along with higher scores in experiencing victimization in the form of direct aggression, was partially confirmed. Positive and significant correlations were identified between Machiavellianism and the perpetration of CDA (both control and direct aggression), while no correlations were observed between Machiavellianism and victimization. Theoretically, individuals with high levels of Machiavellianism tend to employ manipulation and control in intimate relationships, facilitating the perpetration of CDA, particularly in psychological and digital forms, whereas these traits are not necessarily linked to direct victimization (White et al., 2024). These findings are consistent with existing research suggesting that Machiavellianism is associated with behaviors related to emotional and psychological control, contributing to the perpetration of CDA (Brewer et al., 2018; March et al., 2020; Pineda et al., 2021; White et al., 2024).

The results confirmed that individuals with narcissistic traits exhibit higher levels of perpetration of control in CDA. Significant and positive correlations

were found between narcissism and the perpetration of CDA, particularly in the form of control. From a conceptual perspective, individuals with narcissistic traits tend to value grandiosity, entitlement, and a need for admiration, characteristics that promote controlling and domineering behaviors in intimate relationships, thereby increasing the likelihood of perpetrating CDA through control-based behaviors (Oliver et al., 2023). These findings align with existing literature, indicating that individuals with narcissistic traits tend to engage more frequently in perpetrating CDA, particularly through control behaviors (Bhogal & Wallace 2021; Raskin & Hall, 1981; Talbot et al., 2015; Tetreault et al., 2018; Webster et al., 2016).

The hypothesis suggesting that individuals with psychopathic traits would exhibit elevated levels of CDA in both forms of perpetration, particularly through direct aggression, was partially confirmed. Significant correlations were identified between the perpetration of direct aggression in CDA and psychopathy. However, no significant relationships were observed between the perpetration of control in CDA and psychopathy. Individuals with psychopathic traits, characterized by impulsivity, emotional insensitivity, and antisocial behavior, tend to perpetrate direct aggression in intimate relationships, which is consistent with recent evidence indicating that psychopathy is strongly associated with intimate partner violence (Azeredo et al., 2025). These results align with existing literature, supporting the notion that psychopathy is the personality trait most closely associated with CDA, specifically through the perpetration of aggressive behaviors (Iyican & Babcock, 2018; Tetreault et al., 2018; Webster et al., 2016).

Nevertheless, the relationship between the Dirty Dozen variables and CDA is lower than the correlations between CDA and hostility and sociodemographic variables, except in the case of narcissism and its contribution to explaining perpetration by direct aggression (Costa et al., 2021; Palma et al., 2020). The weaker correlations of the Dirty Dozen traits with CDA compared to hostility and sociodemographic factors suggest that immediate emotional states and relational contexts are strong drivers of cyber dating abuse (Anderson & Bushman 2018). Importantly, sociodemographic variables (such as age, gender, or relationship history) help shape the norms, power dynamics, and opportunities in which CDA occurs (Palma et al., 2020; Ugarte & Tapia, 2022). However, narcissism stands out as a specific personality-based exception, strongly linked to perpetration of direct aggression (Costa et al., 2021). This points to a more nuanced picture: while hostility and social context broadly elevate CDA risk, direct aggressive acts (such as insults or threats) may often reflect narcissistic vulnerability, ego threat, and retaliatory impulses (Ugarte & Tapia, 2022).

The findings also validated the hypothesis that individuals with high scores in hostility tend to exhibit higher levels of CDA perpetration. Significant and positive correlations were identified between hostility and the perpetration (both control and direct aggression) of CDA. From a conceptual perspective, individuals with higher levels of hostility demonstrate a greater tendency to react aggressively and exert control in intimate relationships, including digital contexts, which facilitates the perpetration of CDA behaviors (Branson & March, 2021; Deans & Bhogal, 2017; Storey & Pina, 2025). Consistent with our results, existing literature indicates that hostility serves as a significant predictor of CDA perpetration, with online abusers scoring higher in hostility and anger variables (Branson & March, 2021; Deans & Bhogal, 2017; Zweig et al., 2014).

Furthermore, the results confirmed that victims of CDA (in both control and direct aggression) tend to experience higher levels of loneliness. Positive and significant correlations were found between loneliness and victimization (both control and direct aggression) in CDA. Perceived loneliness may increase vulnerability to victimization and may also lead some individuals to engage in aggressive behaviors as a way of coping with isolation, thereby reinforcing the perpetration of CDA (Matthews et al., 2020; Muñiz et al., 2015; Rivas et al., 2023). Additionally, higher correlations were observed between perpetration of CDA and loneliness, suggesting that individuals with a heightened sense of loneliness may resort to more aggressive behaviors to compensate for their perceived social isolation.

To address the fourth objective, research questions were formulated, and the results indicated that sociodemographic variables (gender, age, education, and living alone) act as moderators in the relationship between the dark triad and both victimization and perpetration of CDA. The moderations revealed that being female, aged 26 or older, lacking a university education, and living alone strengthened the association between the dark triad and CDA, both in terms of victimization and perpetration. This suggests that individuals who experience victimization of CDA may, in turn, become perpetrators themselves. Moreover, individuals living alone appear to have less oversight and control over their online actions, potentially facilitating both victimization and perpetration of CDA.

The results partially confirmed that relational variables (relationship status, nature of the relationship, relationship duration) act as moderators in the

relationship between the dark triad and victimization and perpetration of CDA. Moderations were specifically found between relational variables, the dark triad, and the perpetration of CDA. These findings may imply that the typical profile of a perpetrator involves being in a non-committed relationship for more than one year.

Exploring variables related to internet use (use of social networks and daily time spent online for leisure), it was found that not using social networks and spending more than three hours per day online for leisure moderate the relationship between the dark triad and victimization by CDA. These results suggest that (1) individuals who have experienced CDA opt to avoid social networks, seeking alternative online activities; (2) victimization in the realm of CDA can extend beyond social networks and their usage. Additionally, spending more than one hour per day online for leisure showed a moderating relationship between the dark triad and CDA.

Lastly, concerning psychological variables (hostility and loneliness), hostility was identified as a moderator in both forms of CDA (victimization and perpetration) and the dark triad. On the other hand, loneliness only moderates the relationship between the dark triad and the perpetration of CDA, indicating that individuals with a heightened sense of loneliness may tend to perpetrate these behaviors as a way to cope with their perceived loneliness.

In summary, the study's results highlight the significant role of both victimization and perpetration of CDA within the Portuguese population. Concerning personality-related factors, the findings align with existing literature, confirming associations between narcissism, Machiavellianism, psychopathy, and hostility with profiles of CDA perpetrators and victims. This underscores the interconnected nature of victimization and perpetration, suggesting individuals can concurrently experience both roles in CDA (Caridade & Braga, 2019; Costa et al., 2021). This pattern is consistent with studies on CDA in Portugal, which show that victims and perpetrators often share overlapping characteristics, challenging the strict distinction between roles (Ugarte & Tapia, 2022). Loneliness emerges as a prevalent factor among perpetrators of CDA.

Furthermore, the study identifies a distinct profile that distinguishes victims from perpetrators. While sharing some common characteristics, the crucial differentiator is that perpetrators tend to be in non-committed relationships for over a year and experience elevated levels of loneliness. These findings contribute valuable insights, given the limited understanding of the characteristics of CDA victims and perpetrators. The overlap between victimization and perpetration observed in this study highlights the need to consider approaches integrating both roles, allowing an understanding of how individual and relational factors interact in sustaining digital abuse (Caridade & Braga, 2019; Ugarte & Tapia, 2022).

However, the investigation encountered certain limitations. The novelty of the topic and the relatively low societal discussion surrounding it posed challenges in sample collection, introducing potential social desirability bias. Digital means, specifically Google Forms, were employed for questionnaire administration, which limited the ability to address participant queries and potentially introduced biases. The study's focus on a subset of personality and relationship factors also restricts the breadth of conclusions that can be drawn. Another limitation concerns the online time variable. It is important to note that participants responded based on their own perceptions, which may involve some temporal distortion. According to the literature, users can lose track of the time they spend online (Przepiorka et al., 2019) or tend to underestimate the actual time spent on the internet (Gonidis & Sharma, 2017). Additionally, the cross-sectional design of the study prevents causal inferences regarding the relationships between the dark triad of personality, moderating factors, and CDA. Self-report measures may also have introduced biases, including social desirability and recall effects. Despite these limitations, the findings have important practical implications: identifying sociodemographic, relational, and psychological variables that moderate the association between dark triad traits and abusive behaviors can inform the development of prevention and intervention programs in digital relational contexts, as well as digital literacy initiatives aimed at reducing both victimization and perpetration in CDA.

To address these limitations, it is recommended to conduct further research that delves into specific aspects requiring detailed analysis. The importance of longitudinal investigations is emphasized, as they can capture changes in participants' responses over time and contribute to establishing more robust relationships between variables, aiding in the development of a clearer profile of CDA perpetrators and victims Future studies would also benefit from adopting dyadic approaches, capable of capturing reciprocal influences between partners over time (Kenny et al., 2006). Such designs may be particularly useful for examining escalation, retaliation, or coercive reciprocity within relationships. Additionally, using a more tailored questionnaire to explore various types of relationships and CDA is suggested. Detailed studies on loneliness and CDA are proposed to draw specific conclusions. Lastly,

further research examining the relationship between the dark triad and CDA, using a comprehensive scale, is encouraged to identify variables moderating this relationship, building upon the insights gained from the current study. The study's main conclusions are significant for informing about the relationships between CDA, dark personality traits, hostility, and loneliness, shedding light on prevalence, addressing societal taboos, providing empirical evidence, and initiating the development of victim and perpetrator profiles in the context of CDA.

Conflicts of interest

The authors have no conflicts of interest to disclose.

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Annex 1

Table A1.
Descriptive statistics of the items

	M	*SD*	*Asymmetry (SD =0.10)*	*Kurtosis (SD =0.20)*
Cyber Dating Abuse Questionnaire – CibAN	1-6			
1 a). My partner or ex-partner has already controlled the updates on my social media profile.	1.62	1.25	1.89	2.41
1 b). I have already controlled the updates on the social network profile of my partner or ex-partner.	1.66	1.21	1.74	2.14
2 a). My partner or ex-partner has threatened to physically assault me through new technologies.	1.12	0.62	5.83	36.03
2 b). I have threatened to physically assault my partner or ex-partner through new technologies.	1.02	0.24	11.03	124.55
3 a). My partner or ex-partner has already created a fake profile of me on a social network to cause me problems.	1.05	0.44	9.36	93.21
3 b). I have already created a fake profile of my partner or ex-partner on a social network to cause you problems.	1.03	0.26	13.84	229.79
4 a). My partner or ex-partner has already written a comment on social media to insult or humiliate me.	1.10	0.54	6.76	50.80
4 b). I've written a comment on social media to insult or humiliate my partner or ex-partner.	1.03	0.30	11.29	151.64
5 a). My partner or ex-partner has already used my passwords (phone, social media, email) to read/view my messages and/or calls without my permission.	1.41	1.05	2.72	6.89
5 b). I have already used the passwords (mobile phone, social networks, email) of my partner or ex-partner to read/view messages and/or calls without their permission.	1.42	0.91	2.31	5.13
6 a). My partner or ex-partner has already divulged secrets and/or compromising information about me using new technologies.	1.13	0.60	5.75	36.22
6 b). I have already divulged secrets and/or compromising information about my partner or ex-partner, using new technologies.	1.03	0.30	11.90	160.98
7 a). My partner or ex-partner has already confirmed the times of my last connection in the phone apps.	1.46	1.10	2.43	5.13
7 b). I have already confirmed the times of my partner's or ex-partner's last call on the phone apps.	1.41	0.95	2.35	4.79
8 a). My partner or ex-partner has already threatened to divulge secrets or compromising information about me using new technologies.	1.14	0.67	5.30	29.47
8 b). I have threatened to divulge secrets or compromising information about my partner or ex-partner using new technologies.	1.04	0.35	10.32	118.83
9 a). My partner or ex-partner has already used new technologies to impersonate me and cause problems.	1.07	0.49	8.51	76.43
9 b). I've used new technologies to impersonate my partner or ex-partner and cause problems.	1.02	0.26	15.19	257.73
10 a). My partner or ex-partner has already sent me messages insulting and/or humiliating me, using new technologies.	1.40	1.07	2.87	7.67
10 b). I have already sent messages insulting and/or humiliating my partner or ex-partner, using new technologies.	1.23	0.71	3.49	12.87
11 a). My partner or ex-partner has already accessed my social networks, WhatsApp or email without my permission.	1.39	1.10	2.83	7.90
11 b). I have already accessed my partner's or ex-partner's social media without their permission.	1.40	0.90	2.45	6.21

	M	*SD*	*Asymmetry (SD =0.10)*	*Kurtosis (SD =0.20)*
12 a). My partner or ex-partner has already sent and/or posted intimate or sexual photos, images, videos, and/or content of me to others without my permission.	1.05	0.38	9.36	95.84
12 b). I have sent and/or posted sexual photos, images and/or videos of my partner to others without their permission.	1.02	0.28	15.11	242.67
13 a). My partner or ex-partner has already used new technologies to control where I've been and with whom.	1.46	1.08	2.45	5.39
13 b). I have already used new technologies to control where my partner or ex-partner has been and with whom.	1.39	0.93	2.69	7.43
14 a). My partner or ex-partner has already forced me to respond to their calls or messages, immediately after realizing that I had already read them, through new digital technologies.	1.47	1.12	2.50	5.48
14 b). I have already forced my partner or ex-partner to respond to my calls or messages, immediately after realizing that he or she had already read them, using new digital technologies.	1.28	0.80	3.08	9.84
15 a). My partner or ex-partner has already impersonated someone else to test me, using new technologies.	1.13	0.64	5.33	29.50
15 b). I've already impersonated someone else, using new technologies, to test my partner or ex-partner.	1.04	0.33	9.59	112.44
16 a). My partner or ex-partner has already published songs, poems, phrases... about me on your social media profile with the intention of insulting or humiliating me.	1.14	0.66	5.74	34.54
16 b). I've published songs, poems, phrases... About my partner or ex-partner on my social media profile with the intention of insulting or humiliating them.	1.08	0.43	7.10	57.29
17 a). My partner or ex-partner has already accessed the contents of my phone without my permission.	1.51	1.07	2.24	4.75
17 b). I have already accessed the contents of my partner's or ex-partner's mobile phone without their permission.	1.47	0.97	2.31	5.69
18 a). My partner or ex-partner has already spread rumors, gossip and/or jokes about me with the intention of ridiculing me, using new technologies.	1.17	0.72	4.77	23.89
18 b). I have spread rumors, gossip and/or jokes about my partner or ex-partner with the intention of ridiculing him/her, using new technologies.	1.05	0.38	9.61	106.14
19 a). My partner or ex-partner has called me excessively to find out where I have been and with whom.	1.44	1.08	2.66	6.65
19 b). I have called my partner or ex-partner excessively to check where he/she has been and with whom.	1.28	0.76	3.00	9.37
20 a). My partner or ex-partner has already controlled my social media friendships.	1.58	1.20	2.15	3.79
20 b). I've controlled my partner's or ex-partner's social media friendships.	1.47	1.00	2.34	5.34
Dirty Dozen	1-5			
1. I tend to want others to admire me.	2.75	1.16	-0.08	-1.04
2. I tend to want others to pay attention to me.	2.75	1.16	-0.09	-1.10
3. I tend to expect special favors from others.	1.77	0.86	0.98	0.42
4. I tend to seek prestige or status.	2.40	1.17	0.33	-1.06
5. I tend to lack remorse.	2.37	1.15	0.47	-0.75
6. I tend to be callous or insensitive.	2.37	1.16	0.37	-1.00
7. I tend to not be too concerned with or the morality of my actions.	1.68	0.94	1.45	1.56
8. I tend to be cynical.	1.88	1.06	1.10	0.40
9. I've used deceit or lied to get my way.	1.85	1.10	1.07	-0.05
10. I tend to manipulate others to get my way.	1.77	1.02	1.26	0.86

	M	*SD*	*Asymmetry (SD =0.10)*	*Kurtosis (SD =0.20)*
11. I've used flattery to get my way.	2.05	1.11	0.69	-0.76
12. I tend to exploit others towards my own end.	1.43	0.77	2.17	5.13
Hostility	0-4			
1. Feeling easily annoyed or irritated.	1.82	1.03	0.29	-0.45
2. Temper outbursts that you could not control.	0.91	0.90	0.99	0.93
3. Having urges to beat, injure, or harm someone.	0.44	0.73	2.00	4.83
4. Having urges to break or smash things.	0.68	0.95	1.41	1.47
5. Getting into frequent arguments .	1.02	0.91	0.80	0.51
Short-form UCLA Loneliness Scale (ULS-6)	1-4			
1. I lack companionship.	2.49	0.91	-0.07	-0.81
2. I feel part of a group of friends.	1.96	0.96	0.70	-0.51
3. I feel left out.	2.13	0.88	0.34	-0.67
4. I feel isolated from others.	2.23	0.94	0.30	-0.82
5. I am unhappy being so withdrawn.	1.75	0.89	0.82	-0.52
6. People are around me but not with me.	2.24	0.93	0.24	-0.86

Note. M = media; *SD* = standard deviation.