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Unveiling the traumatic impact of cyber dating abuse and offline intimate partner violence: exploring the mediating role of adult attachment

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Cyber Dating Abuse (CDA) corresponds to a traumatic experience involving controlling and harassing behavior by a partner through modern technologies. This study aimed to assess the frequency of CDA, explore its connection to offline violence (specifically Intimate Partner Violence—IPV), and investigate attachment's mediating role in the relationship between various violence forms (cyber and offline) and trauma symptoms. Two groups were recruited for the study: one comprising 342 individuals who reported encountering offline IPV within the previous year and another group of 334 individuals who did not have such experiences. Both groups exhibited CDA, with the IPV-experienced group showing statistically significant higher prevalence. This supports literature indicating a relationship between online and offline violence. Additionally, attachment anxiety mediated CDA controlling, offline IPV, and subsequent PTSD symptoms, while attachment avoidance mediated only between offline IPV and PTSD symptoms. The findings seemed to validate the importance of acknowledging attachment as a mediator for PTSD, both in clinical practice and research.

Literature review on cyber dating abuse (CDA)

Intimate Partner Violence (IPV) denotes any type of violence taking place within a romantic relationship, encompassing physical, psychological, sexual, and economic forms of abuse^{1–4}.

In the past few years, a new type of traumatic form of violence in romantic relationships has surfaced — Cyber Dating Abuse (CDA). CDA is characterized as a means of exerting control and harassment by a dating partner using modern technologies and media. It encompasses various abusive behaviors in digital interactions, including daily monitoring of the partner or ex-partner through social networks; sending or posting offensive comments; transmitting messages containing threats; posting photos and videos with the intent of humiliating or causing harm to the dating partner; unauthorized use of the dating partner's passwords for the purpose of spying^{5,6}. In addition, Zweig, et al.⁷ highlighted the sexual aspect of CDA and proposed a categorization that differentiates between cyber sexual abuse, involving actions like sharing intimate or sexual photos of a dating partner without consent, and non cyber sexual abuse, such as issuing insults or threats through various electronic means.

It is important to emphasize that the definition of CDA varies depending on the theoretical framework and measurement instrument employed. The systematic review conducted by Caridade, et al.⁵ revealed the utilization of 18 different constructs to describe this phenomenon, with the term "cyberdating abuse" being the most frequently employed.

While CDA is frequently linked to offline dating violence, the exact nature of this relationship is currently under investigation. Researchers are exploring the possibility of these phenomena acting as mutual risk factors for each other^{6–8} or conceptualizing CDA as a form of psychological abuse linked to face-to-face intimate violence⁹. Consequently, there is a need for additional research to deepen our understanding of the intricate relationship between these two phenomena.

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The concept of CDA may have substantial implications for mental well-being, leading to increased levels of fear, anxiety, depression, post-traumatic stress disorder (PTSD), and the emergence of suicidal thoughts. e.g.,^{10–14}. These mental health issues appear to be present in individuals with an experience of offline IPV as well^{15–20}.

The relationship between attachment and CDA

Based on the attachment theory²¹, infants possess an inherent inclination to engage with and establish an emotional connection with their primary caregivers. The caregivers provide support during infants' exploratory phases and offer solace in potentially distressing situations. These early interactions, coupled with genetic influences, shape the formation of internal working models (IWM) of attachment²¹ – which correspond to cognitive-emotional schemas that are used in the present and future interpersonal relationships and influence the interpretation of interpersonal exchanges. A similar bond is present in close adult relationships: one person often comes to rely on the other for a sense of safety and security²².

People who experienced consistent and sensitive parenting during their childhood may develop a secure attachment²³. Those with a secure attachment typically view stressful situations as less threatening and are capable of forming intimate, caring relationships in adulthood^{24–29}. On the other hand, individuals who frequently encountered harmful interactions with inconsistent and unresponsive caregivers are likely to develop insecure attachments, which are marked by negative internal perceptions of themselves and others³⁰.

Attachment insecurity is commonly categorized into two primary dimensions: attachment avoidance and attachment anxiety. Individuals exhibiting attachment anxiety commonly undergo enduring apprehension related to interpersonal rejection or abandonment to which they react with hyperactivating coping strategies^{31–33}. Hyperactivation is characterized by persistent efforts to reduce distance from attachment figures and gain their support and affection through controlling behaviors. It also involves an anxious, hypervigilant focus on attachment relationships and an intensification of negative emotions and thoughts³⁰. Individuals with attachment avoidance commonly feel uneasy in close interpersonal relationships. This discomfort often fosters a pattern of deactivating emotion regulation strategies^{31,34}. Deactivation involves efforts to increase distance from attachment figures, avoid reliance on others, pursue self-sufficiency and control, suppress troubling thoughts, and repress painful memories³⁰.

Attachment insecurity may play a mediating role between interpersonal trauma and lack of well-being^{35,36}: in fact, individuals often interpret interpersonal trauma through the lens of their negative internal schemas (e.g., "I am worthless"), heightening their vulnerability to diminished well-being in the aftermath of relational turmoil^{35,37}. In this regard, numerous studies have investigated the relationship between attachment anxiety, avoidance, and PTSD symptoms across various populations. These include adult survivors of interpersonal trauma³⁸, individuals with experiences of partner violence^{39–41}, individuals highly exposed to terrorism⁴², former prisoners of war⁴³, and adults with histories of child maltreatment⁴⁴. For instance, Muller, et al.⁴⁴ found that insecure adult attachment mediated the relationship between childhood abuse and trauma-related symptoms in adulthood.

The literature extensively supports the relationship between attachment and the occurrence of cyberdating abuse as well e.g.,^{45–48}. For example, the study by Laforte, et al.⁴⁵ with 126 couples of adolescents revealed that both girls' and boys' engagement in direct cyber-aggression, whether as victims or perpetrators, correlated similarly with their own elevated levels of attachment anxiety as well as with their partners'. Regarding cyber-control, the findings indicate that boys' and girls' victimization tends to be more strongly linked with their partner's heightened levels of anxious attachment rather than their own. In another cross-sectional study⁴⁸ involving 584 students the findings revealed that attachment anxiety, rather than attachment avoidance, accounted for the association between experiencing parent-to-child aggression and all types of perpetration and victimization in CDA. However, to the best of our knowledge, no other study has explored the mediating role of adult attachment in the relationship between cyberdating violence and symptoms of PTSD.

The present study

Taking into consideration this theoretical framework, the objectives of the present study were:

1. To investigate the prevalence of CDA in two populations: individuals with an experience of IPV and individuals without an experience of partner violence;
2. To examine the relationship between CDA and offline violence, specifically IPV;
3. To investigate the mediating role of attachment in the relationship between all forms of violence – cyberdating and offline IPV – and trauma symptoms. Concerning the mediation model the following hypothesis was made: attachment anxiety and avoidance could mediate the relationship between three predictors – cyber controlling behaviors, cyber aggressive behaviors and offline violence – and PTSD symptoms.

Method Procedure

Participants were enlisted using Snow-Bowling Sampling⁴⁹ through relationships of researchers and various social media platforms (e.g., Facebook, WhatsApp, etc.). A total of 676 participants were successfully recruited. Two groups of participants were present: individuals with an experience of offline IPV in the last year and individuals without an experience of offline IPV in the last year.

Inclusion criteria for individuals with a history of offline IPV included: (A) being over 18 years old; (B) being native Italian speakers; (C) having encountered at least one incident of offline IPV within the past year. The occurrence of IPV was assessed using the Conflict Tactic Scale-2 (CTS2)⁵⁰ – a widely recognized psychometric tool specifically designed for evaluating experiences of violence in intimate relationships (refer to the instrument

section). The employment of the current instrument ensured rigor in screening participants' experiences of offline IPV.

Inclusion criteria for the group of people without an experience of offline IPV were the following: (A) being over 18 years old; (B) being native Italian speakers; (C) not having an experience of offline IPV as emerged from the CTS2⁵⁰. The exclusion criteria consisted of the following: (D) inability to complete the assessment procedure due to illiteracy or (E) inability to complete the questionnaires due to cognitive and/or vision impairments.

This study is part of a broader research project. Participants willingly volunteered and provided their informed consent prior to the inclusion in the study. This research was performed in accordance with the Declaration of Helsinki. The research project had received prior approval from the Ethics Committee of the University of Padua (Protocol Number: 5396).

Participants

A total of 687 participants were contacted. However, 11 of them did not fully complete the questionnaire battery of questionnaire and were consequently excluded from the analysis. Therefore, the final sample included 676 participants.

Group of individuals with an experience of offline IPV

Of the 676 participants, 342 reported having an experience of offline IPV in the previous year. Participants' ages ranged from 18 to 70 years ($M_{age} = 41.37$, $SD = 12.784$). Of this group of participants 300 were women and 42 were men. Considering the sexual orientation, 312(91.2%) self-identified as heterosexual, 6(1.8%) self-identified as gay or lesbians, 21(6.1%) self-identified as bisexual, 3(0.9%) self-identified as pansexual. Considering their current relationship status, 130 (38%) participants were married, 74 (21.6%) were not married but they were living together with their partner, 39 (11.4%) were divorced, 3 (0.9%) were widowed, 53 (15.5%) had a romantic relationship but they were not married or living together with the partner, 43 (12.6%) did not have a romantic relationship at the time of data collection. Considering ethnic provenance, 329(96.2%) participants were Italian, while 13(3.8%) were not. Taking into consideration the presence of children, 130(38%) of participants did not have any children, 87(25.4%) had one child, 105(30.7%) had two children, 16(4.7%) had 3 children, 4 (1.2%) had more than 3 children. Taking into account the level of education, 31(9.1%) had the middle school level, 159(46.5%) had a high school degree, 58(17%) had a bachelor's degree, 74(21.6%) had a master's degree, 14(4.1%) had a Ph.D. Missing information on 6 participants on the education level. Taking into consideration the working status, 21(6.1%) were students, 15(4.4%) participants were student workers, 67(19.6%) had a precarious job, 172(50.3%) had a full-time job, 20(5.8%) were unemployed, 18(5.3%) were housemakers, 19(5.6%) were retired. Demographical information on 10 participants on their working status was missing.

Group of individuals without an experience of offline IPV

Of the 676 participants, 334 participants did not have an experience of offline IPV in the previous year. Participants' ages ranged from 18 to 70 years ($M_{age} = 41.17$, $SD = 14.215$). Of this group of participants, 201 were women and 133 were men. Considering their sexual orientation, 308(92.2%) participants self-identified as heterosexual, 6(1.8%) self-identified as gay or lesbians, 19(5.7%) self-identified as bisexuals. Missing information on sexual orientation was missing for one person. Considering their current relationship status, 136 (40.7%) participants were married, 72 (21.6%) were not married but they were living together with their partner, 16 (4.8%) were divorced, 3 (0.9%) were widowed, 69 (20.7%) had a romantic relationship but they were not married or living together with the partner, 40 (12%) did not have a romantic relationship at the time of data collection. Considering ethnic provenance, 328(98.2%) participants were Italian, while 6(1.8%) were not. Taking into consideration the presence of children, 174(52.1%) of participants did not have any children, 69(20.7%) had one child, 72(21.6%) had two children, 15(4.5%) had 3 children, 4 (1.2%) had more than 3 children. Taking into account the level of education, 17(5.1%) had the middle school level, 169(50.6%) had a high school degree, 56(16.8%) had a bachelor's degree, 80(24%) had a master's degree, 12(3.6%) had a Ph.D. Taking into consideration the working status, 38(11.4%) were students, 20(6%) participants were student workers, 30(9%) had a precarious job, 206(61.7%) had a full-time job, 4(1.2%) were unemployed, 9(2.7%) were housemakers, 23(6.9%) were retired. Demographical information on 4 participants on their working status was missing.

Measures

Socio-demographics information was collected, including: age, sexual orientation, relationship status, nationality, education level, work position, presence of children and, in case, the numerosity.

The experience of offline IPV

To evaluate the prevalence of violence within the previous year, we utilized the Conflict Tactic Scale-Short form CTS2⁵⁰. The CTS2 examines individuals' encounters with both victimization and perpetration. In this study, only the victimization scale was employed. Participants provided responses on an 8-point Likert scale (ranging from "0 = This has never happened" to "7 = Not in the past year, but it did happen before"), indicating the frequency of each occurrence. Scores of 1 to 6 were recoded as 1, denoting experiencing violence in the past year, while scores of 0 and 7 were recoded as 0, signifying no victimization in the last year, following the scoring instructions by Straus and Douglas⁵⁰. Then, two categories were created: 0 (no experience of offline IPV) and 1 (experience of offline IPV in the last year). Reliability was not calculated, adhering to the instrument authors' guidelines⁵⁰.

Cyberdating abuse

The Cyberdating Abuse Questionnaire (CDAQ) by Borrajo, et al.⁶ was used. The victimization scales of the CDAQ were utilized in this study, specifically the Control and Direct Aggression subscales. The Control subscale evaluates partner surveillance or invasion of privacy behaviors, while the Direct Aggression subscale assesses intentional actions aimed at harming the partner through the new technologies and social media. These subscales consist of 20 items on a 6-point Likert scale, ranging from "1: Never. This has never happened in our relationship" to "6: Habitually. It happened more than 20 times." The internal consistency is good: $\alpha = 0.82$ direct aggression subscale and $\alpha = 0.74$ for control subscale⁵¹.

Attachment

The Experience in Close Relationships Scale (ECR-12)^{52,53} was employed to evaluate attachment quality in adult intimate relationships, focusing on anxiety and avoidance. Attachment anxiety is characterized by high anxiety and low avoidance, while attachment avoidance is characterized by low anxiety and high avoidance. Respondents answered on a 7-point Likert scale, where 1 represented "strongly disagree," and 7 represented "strongly agree." The ECR-12 demonstrated robust internal consistency for both the anxiety dimension ($\alpha = 0.85$) and avoidance ($\alpha = 0.86$)⁵⁴.

PTSD Symptoms

The Post-Traumatic Symptoms Questionnaire PTSDQ;⁵⁵ a 12-item survey designed to assess the three primary reactions/domains associated with the impact of traumatic events: (A) intrusivity, (B) avoidance, and (C) hyperarousal. Participants rate items on a 5-point Likert scale, ranging from 1 ("not at all") to 5 ("extremely"). Higher scores indicate greater levels within each respective domain. Additionally, a total scale is included. The PTSDQ demonstrated strong internal consistency for each domain: (A) $\alpha = 0.93$; (B) $\alpha = 0.84$; (C) $\alpha = 0.82$ ⁵⁵.

Data analysis

The R software was employed for the statistical analysis, utilizing several packages including: lavaan⁵⁶, psych⁵⁷, and tidyverse⁵⁸, magrittr⁵⁹, dplyr⁶⁰.

Descriptive statistics were computed. Prior to testing the mediation model, preliminary analyses were conducted, examining correlation values to identify potential issues related to multicollinearity⁶¹. Given the non-normal distribution of some variables, the Spearman correlation coefficient was applied. Correlation values exceeding $|0.80|$ were considered indicative of multicollinearity^{61,62}.

A mediational analysis with observed variables was conducted to investigate the direct effect of three predictors – the Controlling Subscale of the CDAQ; the Aggressive Subscale of the CDAQ; the Offline IPV – on PTSD symptoms and their indirect effects through attachment anxiety and attachment avoidance. The maximum likelihood (MLM) estimator was used to perform the statistical analyses and the Satorra-Bentler scaled χ^2 ^{2,63} was used to evaluate whether the model fit the data.

Sample size determination

Given the intended main statistical analysis outlined in the current investigation (refer to the Statistical Analysis section), we pre-determined the sample size using the "n:q criterion." In this criterion, 'n' signifies the number of participants in the study, and 'q' denotes the number of free model paths⁶⁴. To meet the minimum sample size requirements, Kline⁶⁴ advocates for a minimum of 30 participants per path, expressed as a ratio of 30:1. Consequently, this translates to a minimum sample size of 330 participants.

Results

Cyberdating abuse

The prevalence of actions examined by CDAQ items revealed that individuals who had experienced offline IPV in the last year also reported higher prevalence of all types of Cyberdating abuse compared to those who had not experienced offline IPV during the same period. This finding suggested a relationship between online and offline violence (see Table 1).

The content of CDAQ's items: The partner or ex-partner has	Experience offline IPV	No experience offline IPV	χ^2	df
	Prevalence (%)	Prevalence (%)		
Controlled the status updates on social networks	N = 175 (51.2%)	N = 105 (31.5%)	17.5***	1
Made threats of physical harm using modern technologies	N = 18(5.3%)	N = 3(0.9%)	10.714***	1
Has fabricated a false profile of the respondent on a social network with the intention of causing harm	N = 12(3.5%)	N = 3(0.9%)	5.4*	1
Posted a derogatory comment on a social network	N = 24(7%)	N = 3(0.9%)	16.333***	1
Accessed messages and/or contacts without permission	N = 79(23%)	N = 23(6.9%)	30.745***	1
Has spread secrets about the respondent using new technologies	N = 19(5.6%)	N = 1(0.3%)	16.2***	1
Has checked the time of the respondent's last connection to mobile applications	N = 134(39.2%)	N = 69(20.7%)	20.813***	1
Has made threats to disclose confidential information about the respondent through modern technologies	N = 20(5.9%)	N = 3(0.9%)	12.565***	1
Utilized new technology to assume the identity of the respondent	N = 11(3.2%)	N = 1(0.3%)	8.333**	1
Utilized modern technologies to send messages that were insulting and/or humiliating	N = 86(25.2%)	N = 5(1.5%)	72.099***	1
Has examined my social media accounts, without the respondent's consent	N = 105(30.6%)	N = 43(12.9%)	25.973***	1
Shared or disseminated photos, videos, and/or intimate content with others without the respondent's consent	N = 9(2.7%)	N = 1(0.3%)	6.4*	1
Utilized innovative technology to monitor the respondent's whereabouts and interactions	N = 82(24%)	N = 33(9.9%)	20.521***	1
Has conveyed the intention to respond promptly to the respondent's calls or messages through new technologies	N = 111(32.4%)	N = 32(9.6%)	43.643***	1
Engaged in deceptive behavior by assuming a different identity to assess the respondent's reactions through the new technologies	N = 9(3.9%)	N = 2(0.6%)	4.454*	1
Has shared music, poems, phrases, etc., in status updates on social networks, aiming to demean the respondent	N = 38(11.1%)	N = 3(0.9%)	29.878**	1
Respondent's phone was inspected by the partner without the consent	N = 128(37.4%)	N = 51(15.3%)	33.123***	1
Has disseminated gossip, and/or jokes about the respondent through the new technologies,	N = 33(9.6%)	N = 5(4.2%)	20.632***	1
Made excessive phone calls to monitor the respondent's whereabouts and companionship	N = 81(23.6%)	N = 21(6.3%)	35.294**	1
Controlled the respondent's friendships on social networks	N = 113(33%)	N = 61(18.3%)	15.54***	1

Table 1. Difference in Cyberdating abuse experience in individuals with an experience of offline IPV compared to individuals without experience of IPV.

Mediation model

The model exhibited good goodness-of-fit indices: $\bar{x}SB(1) = 0.318, p = 0.573; CFI = 1; RMSEA = 0.000; 90\%CI [0.000;0.092]; p_{\epsilon \leq 0.05} = 0.774; SRMR = 0.005.$

The findings (refer to Tables 2–3 and Figs. 1, 2) showed that the direct effect of ‘CDA Controlling (path 11: $\beta(SE) = 0.023(0.010); p = 0.024; 95\%CI[0.003;0.043]; \beta^* = 0.125$); ‘Offline IPV’ (path a31: $\beta(SE) = 0.368(0.132); p = 0.005; 95\%CI[0.110;0.626]; \beta^* = 0.114$) on ‘Attachment Anxiety’ were statistically significant. The accounted variance was equal to 4.6% ($R^2 = 0.046$).

In addition, the direct effect of ‘Offline IPV’ (path a32: $\beta(SE) = 0.680(0.120); p < 0.001; 95\%CI[0.445;0.915]; \beta^* = 0.233$) on ‘Attachment Avoidance’ were statistically significant. The accounted variance was equal to 7.0% ($R^2 = 0.070$).

Descriptive Statistics					Correlations					
	Mean	SD	SK	K	1	2	3	4	5	6
1. CDA Controlling	15.991	8.821	1.739	2.941	–					
2. CDA Aggression	12.639	4.306	4.652	29.192	0.516***	–				
3. Offline IPV					0.381***	0.397***	–			
4. Attachment Anxiety	3.743	1.617	0.030	-0.941	0.210***	0.173***	0.168***	–		
5. Attachment Avoidance	2.610	1.460	0.901	0.101	0.217***	0.174***	0.260***	0.064§	–	
6. PTSD Symptoms	31.067	10.510	0.039	-0.439	0.283***	0.342***	0.241***	0.309***	0.133***	–

Table 2. Descriptive statistics and correlation analysis among variables. * $p < 0.050, **p < 0.010, ***p < 0.001$ § = $p > 0.050$ SD standard deviation, SK skewness, K Kurtosis 1. CDA Controlling: Controlling Victimization Subscale of the Cyberdating Abuse Questionnaire 2. CDA Aggression: Aggression Victimization Subscale of the Cyberdating Abuse Questionnaire 3. Offline IPV: Conflict Tactic Scale-Short Form 4. Attachment Anxiety: Attachment Anxiety Subscale of the Experience Close Relationship 5. Attachment Avoidance: Attachment Avoidance Subscale of the Experience Close Relationship 6. PTSD Symptoms: Total Scale of the Post-Traumatic Symptoms Questionnaire.

Path	β^*	β (SE)	z-value	95% CI [L-U]	R ²
Outcome: Attachment Anxiety (M1)					4.6%
CDA Controlling (X ₁) → Attachment Anxiety (M1)	0.125	0.023(0.010)	2.251*	[0.003;0.043]	
CDA Aggression (X ₂) → Attachment Anxiety (M1)	0.029	0.011(0.021)	0.526	[- 0.029;0.051]	
Offline IPV (X ₃) → Attachment Anxiety (M1)	0.114	0.368(0.132)	2.793**	[0.110;0.626]	
Outcome: Attachment Avoidance (M2)					7.0%
CDA Controlling (X ₁) → Attachment Avoidance (M2)	0.088	0.015(0.008)	1.736	[- 0.002;0.031]	
CDA Aggression (X ₂) → Attachment Avoidance (M2)	- 0.031	- 0.011(0.022)	-0.480	[- 0.054;0.033]	
Offline IPV (X ₃) → Attachment Avoidance (M2)	0.233	0.680(0.120)	5.675***	[0.445;0.915]	
Outcome: PTSD Symptoms (Y)					19.5%
Attachment Anxiety (M1) → PTSD Symptoms (Y)	0.266	1.730(0.240)	7.216***	[1.260;2.200]	
Attachment Avoidance (M2) → PTSD Symptoms (Y)	0.083	0.598(0.253)	2.359*	[0.101;1.094]	
CDA Controlling (X ₁) → PTSD Symptoms (Y)	0.085	0.101(0.050)	2.019*	[0.003;0.199]	
CDA Aggression (X ₂) → PTSD Symptoms (Y)	0.178	0.436(0.099)	4.393***	[0.241;0.630]	
Offline IPV (X ₃) → PTSD Symptoms (Y)	0.082	1.731(0.825)	2.098*	[0.114;3.347]	
Effect of X ₁ on Y via M1	0.033	0.039(0.018)	2.184*	[0.004;0.075]	
Effect of X ₂ on Y via M1	0.008	0.019(0.036)	0.522	[- 0.051;0.089]	
Effect of X ₃ on Y via M1	0.030	0.636(0.242)	2.631**	[0.162;1.110]	
Effect of X ₁ on Y via M2	0.007	0.009(0.006)	1.425	[- 0.003;0.021]	
Effect of X ₂ on Y via M2	- 0.003	- 0.006(0.013)	- 0.470	[- 0.033;0.020]	
Effect of X ₃ on Y via M2	0.019	0.406(0.184)	2.214*	[0.047;0.766]	
Total Indirect Effect of the Model	0.095	1.103(0.307)	3.594***	[0.502;1.705]	
Total Effect of the Model	0.790	5.699(0.839)	6.796***	[4.055;7.342]	

Table 3. Mediation model coefficients. * $p < 0.050$, ** $p < 0.010$, *** $p < 0.001$ § = $p > 0.050$ SD standard deviation, SK skewness, K Kurtosis 1. CDA Controlling: Controlling Victimization Subscale of the Cyberdating Abuse Questionnaire 2. CDA Aggression: Aggression Victimization Subscale of the Cyberdating Abuse Questionnaire 3. Offline IPV: Conflict Tactic Scale-Short Form 4. Attachment Anxiety: Attachment Anxiety Subscale of the Experience Close Relationship 5. Attachment Avoidance: Attachment Avoidance Subscale of the Experience Close Relationship 6. PTSD Symptoms: Total Scale of the Post-Traumatic Symptoms Questionnaire.

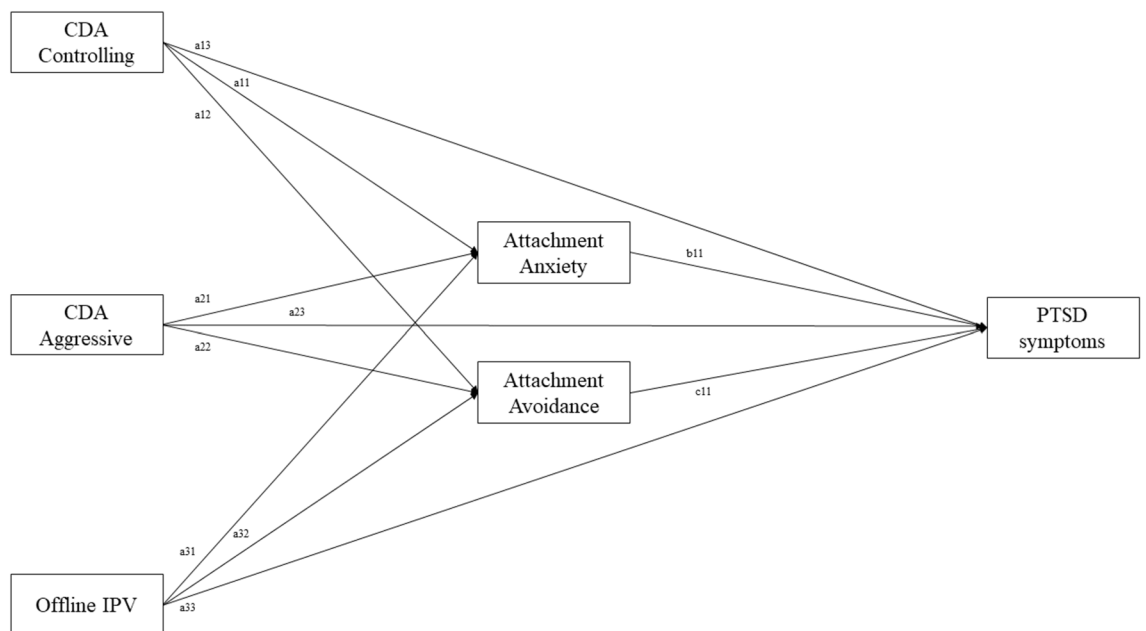


Figure 1. Theoretical Model

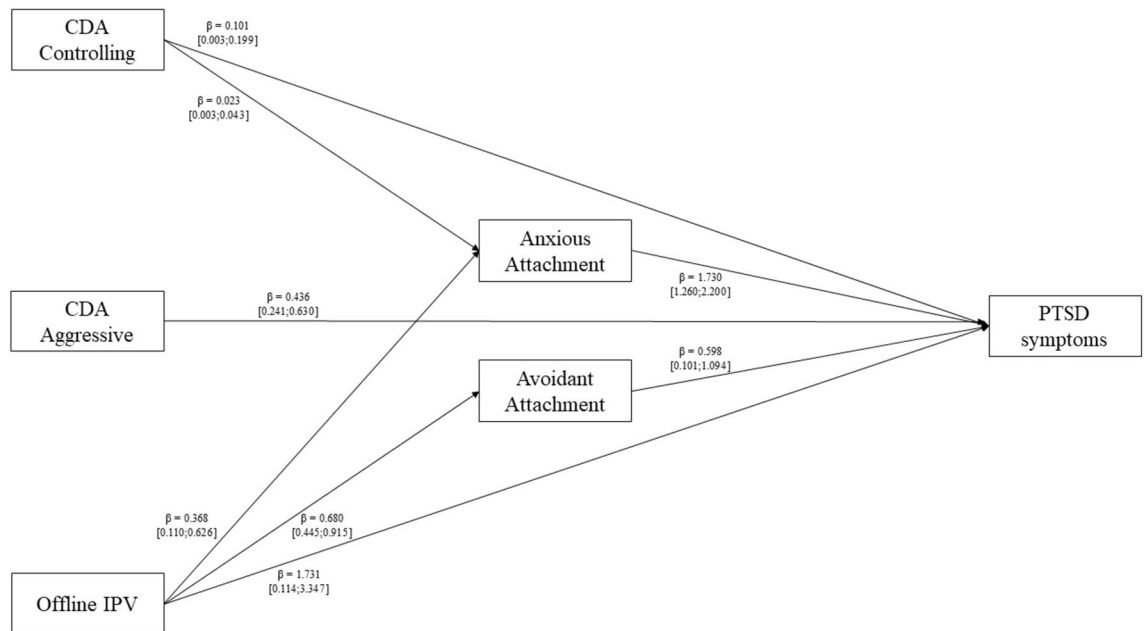


Figure 2. Statistical Model. Only the statistically significant paths are reported in Figure 2.

Moreover, the direct effect of ‘Attachment Anxiety’ (path b13: $\beta(\text{SE}) = 1.730(0.240)$; $p < 0.001$; 95%CI[1.260;2.200]; $\beta^* = 0.266$); ‘Attachment Avoidance’ (path b23: $\beta(\text{SE}) = 0.598(0.253)$; $p = 0.018$; 95%CI[0.101;1.094]; $\beta^* = 0.083$); ‘CDA Controlling’ (path a13: $\beta(\text{SE}) = 0.101(0.050)$; $p = 0.044$; 95%CI[0.003;0.199]; $\beta^* = 0.085$); ‘CDA Aggression’ (path a23: $\beta(\text{SE}) = 0.436(0.099)$; $p < 0.001$; 95%CI[0.241;0.630]; $\beta^* = 0.178$); ‘Offline IPV’ (path a33: $\beta(\text{SE}) = 1.731(0.825)$; $p = 0.036$; 95%CI[0.114;3.347]; $\beta^* = 0.082$) on ‘PTSD Symptoms’ were statistically significant. The accounted variance amounted to 19.5% ($R^2 = 0.195$).

Discussion

CDA can be conceptualized as the utilization of modern technologies and media by a partner to exercise control and engage in harassment towards a current or previous partner⁶. The first two objectives of the present study were to examine the prevalence of CDA among participants and to investigate the relationship between CDA and offline violence, specifically IPV. To tackle these two objectives, the prevalence of CDA was compared through chi-squared models between a group of individuals with an experience of IPV and a group without partner violence experience. The results showed that CDA was experienced by both samples; however, the results revealed that individuals who had experienced offline IPV in the last year reported statistically significant higher prevalence of all types of CDA compared to those who had not experienced offline IPV during the same period. This appeared to confirm the literature that shows that online and offline violence might be related^{6–8}. For example, the study by Zweig, et al.⁷ showed that the prevalence of CDA frequently coincides with various manifestations of dating violence. A substantial portion, fifty percent, of their sample subjected to sexual CDA and non-sexual CDA also reported instances of physical violence. Furthermore, almost all victims of CDA had also encountered other forms of psychologically abusive experiences (Fig. 2).

The third objective of our study delved into exploring, through a mediation analysis, the mediating role of attachment in the relationship between three predictors – aggressive and controlling CDA and offline IPV – and PTSD symptoms. The results confirmed the mediating role of attachment anxiety specifically in the context of CDA controlling, offline IPV, and PTSD symptoms. Consequently, confirming previous literature on the matter⁴⁰, the attachment style in women can be adversely affected by exposure to trauma resulting from partner violence. Attachment anxiety, characterized by heightened concerns about relationships, fear of abandonment, and a strong desire for closeness^{30,37}, appeared to serve as a crucial link between interpersonal trauma and the subsequent experience of PTSD symptoms⁴⁴. A possible interpretation for this result is that both attachment anxiety may disrupt coping mechanisms, thereby elevating the risk of PTSD and other emotional issues following trauma^{40,65}. This insight is important for both researchers and practitioners working in the field of interpersonal violence, as it highlights the importance of assessing and addressing attachment patterns when examining the consequences of different forms of violence. In fact, understanding the mediating role of attachment anxiety stress the importance for more targeted interventions in mitigating the psychological aftermath of both CDA and offline IPV⁶⁶.

However, attachment avoidance mediated only the relationship between offline IPV and PTSD symptoms. This result is in line with previous literature on the matter e.g.,^{67,68} that found no statistically significant association between attachment avoidance and CDA. For example, Reed, et al.⁶⁸ conducted a study involving 881 adolescent participants. The findings indicated that avoidance levels did not have a significant correlation with electronic intrusion (EI), which is defined as the repeated use of social media to harass, pressure, threaten, or coerce a dating partner. However, it is important to emphasize that even though attachment avoidance did not appear to act as a mediator between CDA and PTSD in the present study, the findings revealed a statistically

significant correlation between them. Therefore, it is essential to recognize the potential association between these two variables, even though the nature of the relationship may not be the one investigated in the present study.

These findings can have implications for clinical interventions. Recognizing attachment as a mediator of PTSD symptoms underscores the importance of interventions that delve into understanding how traumatic events have shaped an individual's attachment representations. The potential modification of these representations emerges as a key strategy to contribute to a reduction in symptomatology³¹.

Existing literature suggests that individuals with attachment insecurities may benefit from relationship-based therapies aimed at fostering a capacity for secure attachment^{31,69}. In this regard, the therapeutic relationship presents a unique opportunity for patients to cultivate a sense of safety and trust, enabling them to begin the process of trauma resolution through the establishment of connections, mentalizing experiences, and reworking maladaptive internal representations of self and others (Sandberg, 2010).

Several limitations need to be acknowledged. First, this study utilized a cross-sectional approach, capturing information at a single moment in time. Therefore, establishing causality for the variables under investigation⁷⁰ is not feasible. Future research endeavors could employ longitudinal methodologies to delve into the nature of these relationships. Second, there is a gender imbalance in the sample of individuals with a history of violence, as only 42 men chose to participate in the research project compared to 300 women. Future studies should strive to enhance male representation. Additionally, it is recommended that future studies recruit participants with a history of violence from clinical settings, such as anti-violence centers and shelters.

Conclusions

In conclusion, the study shed light on the prevalence of CDA and its intricate relationship with offline IPV. The findings confirmed a higher prevalence of CDA among individuals with a history of offline IPV, suggesting a potential relationship between online and offline violence. The study further unraveled the mediating role of attachment anxiety in the connection between various forms of violence, including CDA and offline IPV, and the development of PTSD symptoms. This insight emphasized the significance of assessing and addressing attachment patterns in understanding the psychological impact of violence within intimate relationships. Additionally, while attachment avoidance did not serve as a mediator between CDA and PTSD, a significant correlation was observed, highlighting the importance of recognizing the potential association between these variables. Overall, the study may contribute to the field of interpersonal violence, paving the way for more nuanced and effective interventions.

Data availability

The datasets used and/or analyzed during the current study are available from the corresponding author upon reasonable request.

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Author contributions

Conceptualisation: SM and FT. Data curation: FT. Formal Analysis: FT. Investigation: FT; Methodology: SM and FT; Project Administration: SM; Resources: SM; Supervision: SM; Writing—original draft: FT; Writing—review & editing: SM and FT.

Competing interests

The authors declare no competing interests.

Additional information

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