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Brief report

Cross-sectional and temporal associations between cyber dating abuse victimization and mental health and substance use outcomes

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ABSTRACT

The purpose of this study was to investigate the cross-sectional and temporal associations between cyber dating abuse victimization (CDAV) and mental health (i.e., anxiety, PTSD, and depression), and substance use (i.e., alcohol, cigarettes, marijuana and hard drugs). We used data from the 5th and 6th waves of an ongoing longitudinal study of ethnically diverse adolescents from seven public high schools in Texas, U.S. Participants were 641 adolescents (63.3% female) with a mean age of 19.1 years ($SD = .79$) at Wave 5. Analyses suggested that while CDAV was associated with mental health and substance use cross-sectionally, when examining over time, it was only associated with past year hard drug and past month marijuana use. Although long-term mental health effects of CDAV did not emerge in the current study, we identified a temporal link to marijuana and hard drugs, highlighting the need for prevention efforts to incorporate messages about substance use.

Given the prevalence and potentially severe consequences, adolescent relationship abuse is a public health priority (Exner-Cortens, Eckenrode, & Rothman, 2013). Digital technologies offer perpetrators of adolescent relationship abuse with an additional method to target their partners. Cyber dating abuse victimization (CDAV), which includes being stalked, harassed, or controlled and monitored by a romantic partner online (Zweig, Lachman, Yahner, & Dank, 2014), is qualitatively different from victimization by offline forms of adolescent relationship abuse, as the victims can be targeted 24/7, and might, therefore, feel unable to escape the abuse. Moreover, perpetrators might experience fewer inhibitions to engage in abusive behaviors, as their actions are more removed, potentially anonymous, and are less likely to be immediately confronted with the consequences of their behaviors. In light of the potential severity of CDAV, we examined the cross-sectional and temporal associations between CDAV and a number of mental health and substance use outcomes (Van Ouytsel, Walrave, Ponnet, & Temple, 2016).

CDAV has been associated with substance use, as well as symptoms of depression, anxiety, and anger/hostility (Zweig et al., 2014). However, a major limitation in this body of research is the reliance on cross-sectional designs, making temporal inferences impossible. It remains unknown if mental health and substance use precede (and potentially contribute to) CDAV, or vice versa. Previous research on offline forms of dating violence has found that victimization was longitudinally linked with later substance use and negative mental health outcomes, such as depressive symptomatology, or suicidal ideation (Exner-Cortens et al., 2013). The relationship between CDAV and substance use could be explained from the theoretical perspective of the general strain theory, which states that stressors (such as verbal or physical abuse) could lead to engagement in deviant behaviors such as substance use (Agnew, 2008). These behaviors, such as drug use (Agnew, 2008), may be used as a coping mechanism to alleviate their emotions in response

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to stressors (i.e., CDAV). Following general strain theory, we would expect substance use to follow CDAV. A competing theoretical explanation for the associations between CDAV and substance use, could be provided by a lifestyle-routine activity theory perspective. Following this perspective, deviant lifestyles (such as substance use) could put youth at risk for becoming victim of abusive behaviors, as they are more often in situations in which capable guardians who could provide protection (such as parents or teachers) are absent (Gover, 2004). Following a lifestyle-routine activities perspective we could expect substance use to precede CDAV.

The current study addresses this critical gap in the literature by investigating both the cross-sectional and temporal associations between mental health outcomes (i.e., symptoms of anxiety, PTSD, and depression), substance use (i.e., alcohol, cigarette, marijuana, and hard drug use), and CDAV. Given the relationships found in prior literature on cyber dating abuse (e.g., Zweig et al., 2014) and offline forms of dating violence (Van Ouytsel, Ponnet, & Walrave, 2017a), we hypothesize that CDAV will be significantly associated with both mental health and substance use outcomes cross-sectionally, and pose the research question whether CDAV is associated with mental health and substance use outcomes one year later.

1. Methods

1.1. Participants and procedure

Data are from an ongoing longitudinal study of adolescent health (Temple, Shorey, Fite, Stuart, & Le, 2013). At baseline in 2010, 1042 adolescents were recruited from multiple public high schools in southeast Texas to participate in annual surveys. Current analyses use data from Waves 5 (W5, spring 2014, $n = 698$) and 6 (W6, spring 2015, $n = 758$). The final sample included in the analysis were 641 participants (63.3% female) who answered the CDAV questions at Wave 5. Participants self-identified as Hispanic (33.9%), White (27.8%), African American (27.3%), Asian/Pacific Islander (3.1%), and “other” (8.0%) with a mean age of 19.1 years ($SD = .79$) at Wave 5. Among the participants, 384 (59.9%) reported to have experienced at least one type of CDAV in the past year. The study was approved by the last author's Institutional Review Board.

1.2. Measures

CDAV was measured with 12 items adapted from previous studies (Picard, 2007; Zweig, Dank, Yahner, & Lachman, 2013), in which participants reported whether or not (yes/no) if they were victimized in the past year by cyber dating abuse. Anxiety was measured by nine items (scale of 0–2, 0 = *not true or hardly ever true* and 2 = *very true or often true*) derived from the Screen for Child Anxiety Related Emotional Disorders scale (Birmaher et al., 1999). For PTSD, participants responded yes/no to four items from the Primary Care PTSD Screen (Prins et al., 2003). The Center for Epidemiologic Studies Short Depression Scale (Andresen, Malmgren, Carter, & Patrick, 1994) was used to measure past week depressive symptoms on a four-point scale (1 = *less than 1 day* and 4 = *5–7 days*). Reliabilities (i.e., Cronbach's α) of each measure are shown in Table 1.

For substance use, participants responded yes/no if they had in the past-year used alcohol, cigarettes, marijuana, and a range of hard drugs (i.e., cocaine, amphetamines, inhalants, hallucinogens, over the counter cold or cough medicine with the intent to getting high, ecstasy, and prescription medications that weren't prescribed by a health professional). Due to the relatively low use rates of these latter substances, they were combined into one category of “hard drugs”. Participants also reported recent substance use by indicating the number of days during the previous month they had used alcohol or marijuana.

1.3. Statistical analyses

Data analysis was performed using IBM SPSS Statistics for Windows, version 23 (IBM Corporation, Armonk NY, USA). Preliminary analyses were carried out first to examine variable means, frequencies, and correlations using Descriptive Statistics and Pearson Correlation tests. Next, a series of linear and logistic regressions were conducted. Analyses were first performed with W5 data to examine the associations between CDAV and mental health as well as substance use controlling for age, gender, and race. We next examined the associations between W5 CDAV and W6 mental health and substance use variables, controlling for W5 mental health/substance use, age, gender, and race. Reversed relationship directions were tested as well, that is, W5 mental health and W5 substance use predicting W6 CDAV. None of the results were significant. For space reason, these results are not presented.

2. Results

Table 1 shows variable means, frequencies, and correlations. Pearson Correlation tests suggested that CDAV at W5 was significantly correlated with all mental health and substance use variables at W5. The correlation between W5 CDAV and W6 mental health and substance use variables were all significant except for W6 past year alcohol and W6 past month alcohol. As shown in Table 2, linear and logistic regression tests found that CDAV at W5 was significantly associated with all three mental health outcomes and all four forms of substance use at the same time point, even after controlling for age, gender, and race. In temporal associations, CDAV at W5 was significantly associated with past year hard drug use and past month marijuana use (and inversely associated with past month alcohol use) at W6, even after controlling for W5 substance use, age, gender, and race. Conversely, CDAV at W5 was not associated with any mental health variables at W6 once W5 mental health and demographic variables were controlled for.

Table 1
Measure reliabilities, means, frequencies, and correlations among variables.

	Scale Range	M(SD)/Frequency (%)	α	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	
1. W5 CDAV	0–12	1.02 (1.43)	.72	–																		
2. W5 Anxiety	0–18	8.04 (5.03)	.90	.08*	–																	
3. W6 Anxiety	0–18	7.97 (5.32)	.92	.11**	.60**	–																
4. W5 PTSD	0–4	1.09 (1.42)	.81	.19**	.27**	.22**	–															
5. W6 PTSD	0–4	.97 (1.38)	.82	.16**	.21**	.34**	.44**	–														
6. W5 Depression	10–40	18.56 (5.41)	.79	.16**	.50**	.39**	.46**	.33**	–													
7. W6 Depression	10–40	18.70 (5.42)	.79	.16**	.38**	.58**	.34**	.48**	.51**	–												
8. W5 Past year alcohol	1/0	466 (67.2%)	.16**	.11**	.03	.13**	.08*	.15**	.08*	.11**	.07	–										
9. W6 Past year alcohol	1/0	602 (80.3%)	.01	.00	.08*	.10*	.10*	.15**	.06	.11**	.47**	.19**	–									
10. W5 Past year cigarette	1/0	170 (24.5%)	.17**	.05	-.01	.14**	.12**	.13**	.13**	.06	.31**	.25**	.65**	–								
11. W6 Past year cigarette	1/0	204 (27.2%)	.12**	.02	.00	.12**	.15**	.10*	.10*	.14**	.24**	.25**	.29**	.23**	–							
12. W5 Past year marijuana	1/0	262 (37.9%)	.13**	.05	.02	.12**	.10*	.10*	.06	.07	.41**	.27**	.29**	.31**	.58**	–						
13. W6 Past year marijuana	1/0	323 (43.1%)	.13**	-.01	.06	.12**	.17**	.10*	.10*	.16**	.29**	.33**	.24**	.24**	.58**	.32**	–					
14. W5 Past year hard drugs	1/0	112 (16.2%)	.16**	-.03	.05	.10*	.10*	.10*	.07	.08*	.26**	.19**	.34**	.22**	.43**	.49**	.45**	–				
15. W6 Past year hard drugs	1/0	170 (22.7%)	.15**	-.01	.06	.14**	.19**	.07	.07	.17**	.27**	.25**	.35**	.38**	.41**	.49**	.45**	.30**	–			
16. W5 Past month alcohol	0–30	2.82 (4.51)	.13**	-.01	-.07	.11**	.05	.05	.03	.03	.44**	.22**	.30**	.26**	.34**	.22**	.29**	.30**	.34**	–		
17. W6 Past month alcohol	0–30	4.28 (5.77)	-.02	-.04	.02	.08	.09*	-.01	.08*	.09*	.29**	.37**	.25**	.30**	.24**	.30**	.23**	.34**	.48**	.48**	–	
18. W5 Past month marijuana	0–30	2.80 (7.21)	.14**	.01	.02	.09*	.08*	.04	.04	.08	.22**	.15**	.19**	.20**	.50**	.33**	.44**	.32**	.29**	.14**	–	
19. W6 Past month marijuana	0–30	3.60 (8.37)	.15**	.03	.02	.07	.08*	.08*	.08*	.13**	.15**	.19**	.20**	.26**	.35**	.50**	.27**	.41**	.27**	.29**	.47**	–

Notes. *p < .05, **p < .01.

Table 2
Regression coefficients and odds ratios.

	W5 CDAV β /OR[95%CI]		W5 CDAV β /OR[95%CI]
W5 Anxiety	.07†	W6 Anxiety	.04
W5 PTSD	.19***	W6 PTSD	.04
W5 Depression	.15***	W6 Depression	.06
W5 Past year alcohol	1.41*** [1.18, 1.69]	W6 Past year alcohol	.97 [.80, 1.18]
W5 Past year cigarette	1.32*** [1.17, 1.50]	W6 Past year cigarette	1.07 [.90, 1.27]
W5 Past year marijuana	1.22** [1.08, 1.37]	W6 Past year marijuana	1.12 [.96, 1.31]
W5 Past year hard drugs	1.30*** [1.15, 1.47]	W6 Past year hard drugs	1.17* [1.01, 1.36]
W5 Past month alcohol	.14**	W6 Past month alcohol	-.08*
W5 Past month marijuana	.15***	W6 Past month marijuana	.15*

Notes. † $p < .06$, * $p < .05$, ** $p < .01$, *** $p < .001$. W5 CDAV was tested as the independent variable.

3. Discussion

Consistent with previous research (Van Ouytsel et al., 2017b), CDAV was cross-sectionally associated with all measured mental health and substance use variables. However, when examined temporally, victims of cyber dating abuse, relative to nonvictims, were “only” more likely to report past year hard drug use and past-month marijuana use. These findings underscore the need for (cyber) dating violence prevention programs to target substance use, as well as screening for substance use behaviors among victims of cyber dating abuse. These results lend support to the general strain theory (Agnew, 2008), in that substance use could be a way for some adolescents to cope with abusive behaviors.

That CDAV was not temporally linked to mental health outcomes was counter to expectations, and does not necessarily indicate that victims of cyber dating abuse do not suffer mental health consequences. It is possible that the psychological effects of CDAV manifest themselves more acutely and are not apparent over an extended period of time (i.e., one year later when mental health was measured at W6). It is also conceivable that prior mental health status is a more important predictor of later mental health, and thus including prior mental health status as controlling variables masked the effects of CDAV. Also counter to expectations was the inverse association between CDAV and past-month alcohol use. Additional research is needed to fully understand the short- and long-term psychological consequences of CDAV.

Results should be interpreted in light of several limitations, including the use of self-report measures, and a geographically confined sample. Future research would benefit from even larger samples, which will enable researchers to compare outcomes among youth who are exclusively victimized online, exclusively victimized offline, and those who are victimized in both contexts. Despite these limitations, this is the first study to examine the temporal link between cyber dating abuse and mental health and substance use outcomes.

In sum, our study confirmed the cross-sectional associations between CDAV and mental health and substance use outcomes and identified temporal associations between CDAV and past year hard drug use and recent marijuana use. This finding has important implications for dating violence prevention programs, and highlights the need for incorporating messages about substance use in dating violence prevention programs.

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Conflicts of interest

None.

References

- Agnew, R. (2008). General strain theory: Current status and directions for further research. In F. T. Cullen, J. P. Wright, & K. R. Blevins (Vol. Eds.), *Taking stock. The status of criminological theory: Vol. 15*. New Brunswick (USA) and London (UK): Transaction Publishers.
- Andresen, E. M., Malmgren, J. A., Carter, W. B., & Patrick, D. L. (1994). Screening for depression in well older adults: Evaluation of a short form of the CES-D. *American Journal of Preventive Medicine, 10*, 77–84.
- Birmaher, B., Brent, D. A., Chiappetta, L., Bridge, J., Monga, S., & Baugher, M. (1999). Psychometric properties of the screen for Child anxiety related emotional Disorders (SCARED): A replication study. *Journal of the American Academy of Child & Adolescent Psychiatry, 38*(10), 1230–1236.
- Exner-Cortens, D., Eckenrode, J., & Rothman, E. (2013). Longitudinal associations between teen dating violence victimization and adverse health outcomes. *Pediatrics, 131*(1), 71–78.
- Gover, A. R. (2004). Risky lifestyles and dating violence: A theoretical test of violent victimization. *Journal of Criminal Justice, 32*(2), 171–180.

- IBM Corporation (2015). *IBM SPSS Statistics for Windows, version 23.0*. Released Armonk, NY: IBM Corporation.
- Picard, P. (2007). *Tech abuse in teen relationships*. Chicago, IL: Teen Research Unlimited.
- Prins, A., Ouimette, P., Kimerling, R., Cameron, R. P., Hugelshofer, D. S., Shaw-Hegwer, J., ... Sheikh, J. I. (2003). The primary care PTSD screen (PC-PTSD): Development and operating characteristics. *Primary Care Psychiatry, 9*(1), 9–14.
- Temple, J. R., Shorey, R. C., Fite, P., Stuart, G., & Le, V. D. (2013). Substance use as a longitudinal predictor of the perpetration of teen dating violence. *Journal of Youth and Adolescence, 42*(4), 596–606.
- Van Ouytsel, J., Ponnet, K., & Walrave, M. (2017a). The associations of adolescents' dating violence victimization, well-being and engagement in risk behaviors. *Journal of Adolescence, 55*, 66–71.
- Van Ouytsel, J., Torres, E., Choi, H. J., Ponnet, K., Walrave, M., & Temple, J. R. (2017b). The associations between substance use, sexual behaviors, bullying, deviant behaviors, health, and cyber dating abuse perpetration. *The Journal of School Nursing, 33*(2), 116–122.
- Van Ouytsel, J., Walrave, M., Ponnet, K., & Temple, J. R. (2016). Digital forms of dating violence: What school nurses need to know. *NASN School Nurse, 31*(6), 348–353.
- Zweig, J. M., Dank, M., Yahner, J., & Lachman, P. (2013). The rate of cyber dating abuse among teens and how it relates to other forms of teen dating violence. *Journal of Youth and Adolescence, 42*(7), 1063–1077.
- Zweig, J. M., Lachman, P., Yahner, J., & Dank, M. (2014). Correlates of cyber dating abuse among teens. *Journal of Youth and Adolescence, 43*(8), 1306–1321.