



Copyright © 2018 International Journal of Cyber Criminology – ISSN: 0973-5089
January – June 2018. Vol. 12(1): 171-186. DOI: 10.5281/zenodo.1467891
Publisher & Editor-in-Chief – K. Jaishankar / Open Access (Authors / Readers No Pay Journal).

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Cyber-Sexual Violence and Negative Emotional States among Women in a Canadian University

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Abstract

Cyber-sexual violence refers to a form of harmful sexually aggressive behaviors committed with the facilitation of digital technologies. Such harmful behaviors can include non-consensual pornography and other image-based sexual exploitation, online sexual harassment, cyber-stalking, online gender-based hate speech, and the use of a carriage service to arrange/attempt to arrange a victim's sexual assault. This article examines the cyber-sexual violence experiences reported by a sample of women on university campuses in Ontario, Canada. Specifically, this study documented the types and forms of cyber-sexual violence that female university students have experienced, whether they disclosed the incidents and their association with negative health emotional states. This study provided evidence indicating that experiences of cyber-sexual violence are associated with symptoms of depression, anxiety, stress, and posttraumatic reactions, regardless of individuals' disclosure experiences. In light of these findings it is crucial that service providers and legislative initiative begin to adapt to the changing technological nature of crimes against women.

Keywords: Technology, Sexual Violence, Online Victimization, Disclosure, University.

Introduction

Women attending Canadian universities continue to be at risk for sexual victimization (e.g., Ontario Women's Directorate, 2013; Stermac, Bance, Cripps, & Horowitz, under review). Given that this group of women is both avid users of new technologies and overrepresented as victims of sexual violence, they are at particular risk for experiencing cyber-sexual violence, a form of harmful sexually aggressive behaviors committed with the assistance or use of new technologies (Henry & Powell, 2015). Cyber-sexual violence is an emerging social and public health issue that can significantly impact those who experience it, yet our knowledge and understanding of this issue is limited. This study contributes further to what is already known about cyber-sexual violence by investigating the forms of cyber-sexual violence that are occurring among female university students and their association with disclosure and negative emotional states.

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Although the term cyber-sexual violence or technology-facilitated sexual violence can be used to collectively describe the range of harmful sexually aggressive behaviors perpetrated against women with the assistance or use of new technologies (Henry & Powell, 2015), according to some researchers technology-facilitated sexual violence may be a multifaceted concept that consists of six distinct but related categories (Henry & Powell, 2014; 2016). These categories include: (1) non-consensual pornography or revenge porn, which is the unauthorized creation and/or distribution of sexually explicit images of the victim, (2) the actual or threatened creation and/or distribution of sexual assault images, (3) the use of a carriage service to arrange/attempt to arrange a victim's sexual assault, (4) online sexual harassment, which involves asking someone intimate questions or sending them unwanted pornographic material via the internet and cyber-stalking, which involves the repetitive pursuit of an individual through electronic or Internet-enabled devices (Reyns, Henson, & Fisher, 2012), (5) online gender-based hate speech, which involves offensive and degrading comments directed at a person or a group of people based on their gender, and (6) virtual rape, which is when a person's avatar is subjected to simulated sexual violence by other avatars (Boyd, 2009; Dibbell, 1998).

It has only been within the last few years that empirical research has emerged discussing the prevalence of cyber-sexual violence against young adult women (for review see Henry & Powell, 2016). To date much of the research on cyber-sexual violence has looked exclusively at children and adolescent victims (e.g., Beech, Elliott, Birgden, & Findlater, 2008; Bossler, Holt, & May, 2012; Craven, Brown, & Gilchrist, 2006), who although in positions of vulnerability tend to have more restricted access to technologies compared to university-aged individuals.

Furthermore, the majority of research in this area has focused on the areas of non-consensual pornography (Cyber Civil Rights Initiative, 2013; Henry & Powell, 2014), online sexual harassment and cyber-stalking (Barak, 2005; Baumgartner, Valkenburg, & Peter, 2010; Burke, Wallen, Vail-Smith, & Knox, 2011; DreBing, Bailer, Anders, Wagner, & Gallas, 2014; Finn, 2004; Finn & Banach, 2000; Spitzberg & Hoobler, 2002; Staude-Müller, Hansen, & Voss, 2012; Thompson & Morrison, 2013; Ybarra, Espelage, & Mitchell, 2007; Ybarra & Mitchell, 2008), and gender-based hate speech (Ballard & Welch, 2017; Guichard, 2009; Lee & Leets, 2002; Nussbaum, 2010). For instance, the Cyber Civil Rights Initiative (2013) surveyed women online and found that 1 in 10 ex-partners have threatened to publish their partner's sexually explicit images online after the relationship ended and 60% of these individuals eventually followed through on their threat. The same study also found that 90% of non-consensual pornography victims were female. Preliminary estimates have also indicated that approximately 1 in 5 American college males have perpetrated at least one form of online sexually coercive behavior (Thompson & Morrison, 2013). Furthermore, available research to date suggests that online sexual harassment and cyber-stalking tend to be strongly directed towards young women across the globe (Barak, 2005; Biber, Doverspike, Baznik, Cober, & Ritter, 2002; Finn & Banach, 2000). Specifically, Griffiths (2000) found that 41% of women in the United Kingdom who regularly use the internet have been sent unsolicited pornographic materials or been harassed or stalked on the Internet. The Pew Research Center (2014) surveyed adult internet users and found that women were more likely than men to be sexually harassed while online (25% compared to 13%). Similarly, Reyns and colleagues (2012) found that 40% of American college student have been the victim of cyber-stalking

at some point in their lives, with 60% of cyber-stalking victims typically being women (Tjaden & Thoennes, 2000). Additionally, the General Social Survey on Victimization reported that 16% of respondents have witnessed hatred or promotion of violence against an identifiable group while on the internet (Statistics Canada, 2011), with 16% of these incidents being directed towards women. Likewise, individuals posting online under female names received 25 times more sexually threatening and hateful comments than individuals writing under male names (Meyer & Cukier, 2006).

Despite the abundance of research addressing the relationship between sexual violence not involving technology and negative sequelae, only a small number of empirical studies have been conducted addressing the relationship between cyber-sexual violence and negative health outcomes. The little research that has been conducted on how cyber-sexual violence impacts victims has focused on non-consensual pornography, online sexual harassment, and cyber-stalking. For instance, the Cyber Civil Rights Initiative (2013) reported that over 93% of non-consensual pornography victims experience severe emotional distress and anxiety and 47% of victims contemplated suicide as a result of the experience. It is also not uncommon for victims to experience high levels of shame whenever they view the image or imagine others viewing the image (Citron & Franks, 2014). Additionally, online sexual harassment and coercion have been associated with higher levels of anger, alcohol and other drug use, as well as a poor relationship with parents (Ybarra et al., 2007). It is also not uncommon for victims to experience anxiety, difficulty thinking positive thoughts, and an inability to focus on tasks (Nobles, Reyns, Fox, & Fisher, 2014). With specific reference to cyber-stalking, victims are known to experience a sense of fear and intimidation as well as stress and anxiety (Hazelwood & Koon-Magnin, 2013). Thus, the early investigative research indicates that cyber-sexual violence can have both significant and long-lasting consequences for victims. Although this evidence provides a starting point for empirical investigations, more evidence is needed to determine the exact forms of cyber-sexual violence that are occurring and their differential impact on victims, particularly university women.

A variable widely assumed to affect women's wellbeing following a victimization incident are the victims' experiences disclosing and reporting the incident. Empirical research suggests that disclosure of negative experiences is associated with lower levels of depression (Broman-Fulks et al., 2007), social anxiety (Brown & Heimberg, 2001), negative mood, psychological distress, and traumatic stress (Kearns, Edwards, Calhoun, Gidycz, 2010) as well as increased grade point average (Pennebaker & Francis, 1996). However, disclosure does not always result in positive outcomes; in fact, negative disclosure reactions can have noticeably adverse impacts on victims. For instance, negative reactions to the disclosure of sexual assault (i.e., being blamed or stigmatized for the assault, controlling or distracting responses, and disregarding the victim's needs, and acting overly distressed by the disclosure) (Ullman, 2000) have been linked to greater post-traumatic stress disorder (PTSD) symptomology, self-blame, and maladaptive coping strategies (Littleton & Radecki Breikopf, 2006; Ullman & Filipas, 2001; Ullman, Townsend, Filipas, & Starzynski, 2007). In light of these findings, research into the relationship between disclosure helpfulness and negative outcomes is needed to further understand the impact of cyber-sexual violence on university women.

Purpose of the Study

Despite increased focus on sexual violence among university women, little of this research has examined cyber-sexual violence among this group. The purpose of this study was to examine the cyber-sexual violence experiences of women on university campuses in Canada. Specifically, this study addressed the following research questions: 1) what are the forms of cyber-sexual violence experienced by female university students, 2) what are the disclosure behaviors of female students who experience cyber-sexual violence, 3) what is the relationship between cyber-sexual violence and negative emotional states, and 4) does the helpfulness of women's disclosure experiences impact the above relationship?

Participants

Participants were women, age 18 to 35 years old ($M_{age} = 21.00$, $SD = 2.70$, $N = 100$) who were enrolled in an undergraduate degree program at universities in Ontario, Canada. One hundred and three women accessed the survey, however, due to attrition (i.e., participants' not completing the survey in its entirety) the final sample consisted of 80 women. The majority of participants identified themselves as White/Caucasian ($N = 44$; 43%), followed by South Asian/Chinese ($N = 26$; 25%), East Asian/Middle Eastern ($N = 17$; 16%), Other ($N = 10$; 10%), and Hispanic/Latino ($N = 5$; 5%). Furthermore, 40% ($N = 41$) of participants identified themselves as visible or racialized minorities, 1% ($N = 1$) identified themselves as an aboriginal person, and 9% ($N = 9$) identified themselves as having a disability. The majority of participants identified themselves as heterosexual ($N = 80$; 78%), followed by bisexual ($N = 11$; 11%), homosexual ($N = 5$; 5%), asexual ($N = 3$; 3%), pansexual ($N = 2$; 2%), and other ($N = 1$; 1%). In terms of relationship status, a large portion of participants stated they were single ($N = 46$; 45%), followed by in a relationship or relationships ($N = 35$; 34%), dating ($N = 17$; 16%), and married or common law ($N = 4$; 4%). With regard to living situation, the majority of participants reported that they lived off-campus with a roommate or roommates ($N = 46$; 45%) followed by off-campus with one or more parents/guardians ($N = 43$; 42%), off-campus alone ($N = 8$; 8%), and university residence ($N = 4$; 4%). Participants were enrolled in various programs/faculties including arts and science, life sciences, social sciences, humanities, engineering, and others, with 95% of participants being enrolled in full-time studies.

Measures

Cyber Sexual Violence

Women students attending universities in Ontario were asked about their experiences of cyber-sexual violence occurring during the time they were enrolled in their undergraduate program. Cyber-sexual violence was defined as unwanted sexual experiences occurring with the assistance or use of new technologies. In order to determine the types of cyber-sexual violence that are being experienced by university women, participants answered questions designed by the researchers and based on Henry and Powell's (2014) categories of cyber-sexual violence. Informed by these categories, participants were asked about the frequency with which they have experienced each form of cyber-sexual violence (e.g., in the last year, how often has someone created and/or distributed a sexually explicit image of you without your permission (i.e., non-consensual pornography or revenge porn)? Similar to previous research conducted by Thompson and

Morrison (2013), responses are based on a 6-point scale (0= *never* and 5= *every day or almost every day*).

Background and demographic information

A background questionnaire developed by the researchers was used to obtain demographic information. This included information regarding the participants' age, ethno-cultural background, sexual orientation, relationship status, living situation, and program of study.

Disclosure and reporting

Participants were also asked questions regarding their disclosure and reporting behavior following the most severe incident of cyber-sexual violence (e.g., with regard to your most severe experience of cyber-sexual violence, did you disclose the incident to anyone?). Participants who endorsed this item were then asked a follow-up question (i.e., how helpful was this disclosure to you?). Here the response format was a 5-point Likert scale (1 = *not at all useful* and 5 = *very useful*). These items provided information regarding the disclosing and reporting behaviors of victims of cyber-sexual violence and also allowed for the determination of whether disclosing and reporting are related to the psychological impact that cyber-sexual violence has on victims.

Negative emotional states

In order to assess distress reactions, participants completed the *Depression, Anxiety and Stress Scale (DASS-21)*; Henry & Crawford, 2005) based on how they felt in the month following their cyber-sexual victimization experience. Participants ranked their endorsement of items based on a 4-point scale (0= *did not apply to me at all* and 3= *applied to me very much or most of the time*). In order to assess participants' symptoms of posttraumatic stress, participants also completed the *PTSD Check List (PCL)*; Weather, Litz, Herman, Huska, & Keane, 1993) based on how they felt in the year following their cyber-sexual victimization experience. The *PCL* is a 17-item scale where participants are instructed to rank their endorsement of posttraumatic symptoms based on a 5-point Likert scale (1= *not at all* and 5= *extremely*).

Procedure

Following approval from the university ethics review board, potential participants were provided with a brief description of the study as well as a link to the study and additional information, via flyers posted in areas surrounding Ontario universities and online advertisements on university-based websites and social networking sites. In particular, three universities within the greater Toronto area were specifically targeted. These universities had undergraduate populations ranging from approximately 40,000 - 60,000 students and were all located in a large urban area.

Those interested in participating were provided with a consent form and an online survey. The survey was comprised of a battery of self-report measures created using Survey Wizard, which is a secure web-based application designed for constructing and managing Internet surveys. At the culmination of the survey, participants were thanked for their participation and directed to a resource list. This resource information contained a list of local, national, and international support resources for any individual experiencing distress.

Results

1. Univariate descriptive statistics

Univariate descriptive statistics were computed for variables of interest. The means and standard deviations for each form of cyber-sexual victimization are separated in Table 1, with means computed based on a 6-point scale (0= *never* and 5= *every day or almost every day*). The three most common cyber-sexual violence experiences reported by this sample of university women were online gender-based hate speech with 58% ($N= 46$) of the sample reporting experiencing this at least once in the last year, followed by online sexual harassment ($N= 42$; 53%), and cyber-stalking ($N= 41$; 52%). Some participants also reported experiences including non-consensual pornography ($N= 16$; 20%), sexual assault image distribution ($N= 8$; 10%), the use of a carriage service to arrange/attempt to arrange a victim’s sexual assault ($N= 6$; 8%), and lastly virtual rape ($N= 6$; 8%).

Table 1. Mean frequency of forms of cyber-sexual violence

	<i>M</i>	<i>SD</i>
Online Gender-based Hate Speech	1.40	1.52
Online Sexual Harassment	1.28	1.41
Online Stalking	1.05	1.16
Non-consensual Pornography	.41	.98
Sexual Assault Image Distribution	.29	.90
Virtual Rape	.25	.88
Use of Carriage service to Arrange Sexual Assault	.21	.72

Note: $N= 80$; 0= never and 5= every day or almost every day

With regards to disclosure and reporting (See Table 2), the majority of women in the sample (57%; $N= 51$) did not disclose their most severe cyber-sexual violence experience to anyone. Among those who did disclose their experience, 26% ($N= 23$) stated that it was “Very helpful”, 26% ($N= 23$) stated that it was “Moderately helpful”, 20% ($N= 18$) stated that it was “Somewhat helpful”, 26% ($N= 23$) stated that it was “Slightly helpful” and, 3% ($N= 3$) stated that it was “Not at all helpful”.

Table 2. Cyber-sexual violence disclosure and reporting characteristics

Characteristic	Frequency (%)
Disclosure of experience	
Not Disclosed	51 (57)
Disclosed	39 (43)
Helpfulness of disclosure	
Not at all helpful	3 (3)
Slightly helpful	23 (26)
Somewhat helpful	18 (20)
Moderately helpful	23 (26)
Very helpful	23 (26)

Note: $N= 80$

In terms of negative emotional states (See Table 3) the average *DASS-21* depression score for participants ($M= 10.93$, $SD= 12.80$) was in the mild range, the average *DASS-21* anxiety score ($M= 9.48$, $SD= 12.12$) was also in the mild range, whereas the average *DASS-21* stress score ($M= 12.28$, $SD= 12.53$) was in the normal range. For symptoms of posttraumatic stress, the average *PCL* score ($M= 36.67$, $SD= 20.87$) was above the suggested cut-off for clinical relevance among general population samples and in civilian primary care settings.

2. Hierarchical Multiple Linear Regression

We conducted four separate hierarchical multiple linear regressions (See Table 4) to explore the relationships between cyber-sexual violence (created by summing each participants' scores for items measuring non-consensual pornography, sexual assault image distribution, the use of a carriage service to arrange a sexual assault, online sexual harassment, cyber-stalking, online gender-based hate speech, and virtual rape) and disclosure helpfulness (i.e., 1= *not at all helpful* and 5= *very helpful*) on negative symptoms of depression, anxiety, stress and posttraumatic symptoms.

Table 3. Descriptive statistics and correlations among study variables

	<i>M</i>	<i>SD</i>	1	2	3	4	5
1. Overall Cyber-sexual Violence Experience Score	4.45	5.51	--				
2. <i>DASS-21</i> Depression Score	10.93	12.80	.51**	--			
3. <i>DASS-21</i> Anxiety Score	9.48	12.12	.57**	.91**	--		
4. <i>DASS-21</i> Stress Score	12.85	12.53	.55**	.89**	.90**	--	
5. <i>PCL</i> Score	36.67	20.87	.58**	.91**	.89**	.89**	--
6. Disclosure Helpfulness	2.46	1.22	-.02	-.10	-.90	-.11	-.05

Notes: $N= 32$; * indicates $p < .05$ ** indicates $p < .01$

a. Depression

We conducted a hierarchical multiple linear regression to explore the relationship between cyber-sexual violence and disclosure helpfulness ratings on depression symptomology. Cyber-sexual violence and disclosure helpfulness acted as the predictor variables, and depression symptomology acted as the predicted variable. Cyber-sexual violence was entered alone in model 1a, followed by disclosure helpfulness in model 1b. Regression model 1a was significant $\Delta R^2 = .19$, $\Delta F(1, 30) = 6.84$, $p = .014$. Cyber-sexual violence accounted for 18.60% of the variance in depression scores. Within the model, cyber-sexual violence accounted for 18.57% of the variance in depression scores, $b_{\text{cyber}} = .43$, $t(30) = 2.62$, $p = .014$, 95% CI [.21, 1.67], $r_{\text{part}} = .43$, VIF = 1.00.

In contrast, model 1b was not significant, $\Delta R^2 = .02$, $\Delta F(1, 29) = .63$, $p = .43$. Cyber-sexual violence and disclosure helpfulness together predicted only 1.70% of the variance in depression scores, but the contribution of disclosure helpfulness did not significantly account for additional variance in depression. Cyber-sexual violence significantly uniquely accounted for 14.67% of the variance in depression scores above and beyond the contributions of disclosure helpfulness, $b_{\text{cyber}} = .40$, $t(29) = 2.31$, $p = .028$, 95% CI [.10, 1.62], $r_{\text{part}} = .38$, VIF = 1.07. That is, as the frequency of cyber-sexual violence experiences increases, so do women’s ratings of depression. However, disclosure helpfulness was not significant and uniquely predicted only 1.74% of the variance in depression scores, above and beyond the common contributions of all variables in the model, $b_{\text{disclosure}} = .14$, $t(29) = .80$, $p = .43$, 95% CI [-2.38, 5.40], $r_{\text{part}} = .13$, VIF = 1.07. That is, increases in disclosure helpfulness ratings are not independently related to significant increases in depression scores above and beyond the contributions of all variables in the model.

Table 4. Hierarchical multiple linear regressions predicting depression, anxiety, stress, and PTSD

	Variable	ΔR^2	<i>B</i>	<i>SE B</i>	β	<i>F</i>
Model 1a		.19				6.84*
	Cyber-sexual violence		.94	.36	.43*	
Model 1b		.02				.63
	Cyber-sexual violence		.86	.37	.40*	
	Disclosure		1.51	1.90	.14	
Model 2a		.22				8.68**
	Cyber-sexual violence		1.02	.35	.47**	
Model 2b		.01				.53
	Cyber-sexual violence		.96	.36	.44*	
	Disclosure		1.34	1.85	.12	
Model 3a		.20				7.58*
	Cyber-sexual violence		.97	.35	.45*	
Model 3b		.00				.05
	Cyber-sexual violence		.99	.37	.46*	
	Disclosure		-.42	1.89	-.04	
Model 4a		.28				11.65**
	Cyber-sexual violence		1.81	.53	.53**	
Model 4b		.00				.09
	Cyber-sexual violence		1.77	.56	.52**	
	Disclosure		.86	2.85	.05	

Note: *N* = 32* indicates $p < .05$ ** indicates $p < .01$

b. Anxiety

We conducted a hierarchical multiple linear regression to explore the relationship between cyber-sexual violence and disclosure helpfulness ratings on anxiety symptomology. Cyber-sexual violence and disclosure helpfulness acted as the predictor variables, and anxiety symptomology acted as the predicted variable. Cyber-sexual violence was entered alone in model 2a, followed by disclosure helpfulness in model 2b.

Regression model 2a was significant $\Delta R^2 = .22$, $\Delta F(1, 30) = 8.68$, $p = .006$. Cyber-sexual violence accounted for 22.40% of the variance in anxiety scores. Within the model, cyber-sexual violence accounted for 22.47% of the variance in anxiety scores, $b_{\text{cyber}} = .47$, $t(30) = 2.95$, $p = .006$, 95% CI [.31, 1.73], $r_{\text{part}} = .47$, VIF = 1.00.

In contrast, model 2b was not significant, $\Delta R^2 = .01$, $\Delta F(1, 29) = .53$, $p = .473$. Cyber-sexual violence and disclosure helpfulness together predicted only 1.40% of the variance in anxiety scores, but the contribution of disclosure helpfulness did not significantly account for additional variance in anxiety. Cyber-sexual violence significantly uniquely accounted for 18.32% of the variance in anxiety scores above and beyond the contributions of disclosure helpfulness, $b_{\text{cyber}} = .44$, $t(29) = 2.64$, $p = .013$, 95% CI [.22, 1.70], $r_{\text{part}} = .43$, VIF = 1.07. That is, as the frequency of cyber-sexual violence experiences increases, so do women's ratings of anxiety. However, disclosure helpfulness was not significant and uniquely predicted only 1.39% of the variance in anxiety scores, above and beyond the common contributions of all variables in the model, $b_{\text{disclosure}} = .12$, $t(29) = .73$, $p = .473$, 95% CI [-2.44, 5.12], $r_{\text{part}} = .12$, VIF = 1.07. That is, increases in disclosure helpfulness ratings are not independently related to significant increases in anxiety scores above and beyond the contributions of all variables in the model.

c. Stress

We conducted a hierarchical multiple linear regression to explore the relationship between cyber-sexual violence and disclosure helpfulness ratings on stress symptomology. Cyber-sexual violence and disclosure helpfulness acted as the predictor variables, and stress symptomology acted as the predicted variable. Cyber-sexual violence was entered alone in model 3a, followed by disclosure helpfulness in model 3b. Regression model 3a was significant $\Delta R^2 = .20$, $\Delta F(1, 30) = 7.58$, $p = .010$. Cyber-sexual violence accounted for 20.20% of the variance in stress scores. Within the model, cyber-sexual violence accounted for 20.16% of the variance in stress scores, $b_{\text{cyber}} = .45$, $t(30) = 2.75$, $p = .010$, 95% CI [.25, 1.69], $r_{\text{part}} = .45$, VIF = 1.00.

In contrast, model 3b was not significant, $\Delta R^2 = .00$, $\Delta F(1, 29) = .05$, $p = .828$. Cyber-sexual violence and disclosure helpfulness together predicted only .10% of the variance in stress scores, but the contribution of disclosure helpfulness did not significantly account for additional variance in stress. Cyber-sexual violence significantly uniquely accounted for 19.71% of the variance in stress scores above and beyond the contributions of disclosure helpfulness, $b_{\text{cyber}} = .46$, $t(29) = 2.68$, $p = .012$, 95% CI [.23, 1.75], $r_{\text{part}} = .44$, VIF = 1.07. That is, as cyber-sexual violence increases, so do women's ratings of stress. However, disclosure helpfulness was not significant and uniquely predicted only .13% of the variance in stress scores, above and beyond the common contributions of all variables in the model, $b_{\text{disclosure}} = -.04$, $t(29) = -.22$, $p = .828$, 95% CI [-4.28, 3.45], $r_{\text{part}} = -.04$, VIF = 1.07. That is, decreases in disclosure helpfulness ratings are not independently related to significant increases in stress scores above and beyond the contributions of all variables in the model.

d. Posttraumatic stress

We conducted a hierarchical multiple linear regression to explore the relationship between cyber-sexual violence and disclosure helpfulness ratings on posttraumatic stress symptomology. Cyber-sexual violence and disclosure helpfulness acted as the predictor

variables, and posttraumatic stress symptomology acted as the predicted variable. Cyber-sexual violence was entered alone in model 4a, followed by disclosure helpfulness in model 4b. Regression model 4a was significant $\Delta R^2 = .28$, $\Delta F(1, 30) = 11.65$, $p = .002$. Cyber-sexual violence accounted for 28.00% of the variance in posttraumatic stress scores. Within the model, cyber-sexual violence accounted for 27.98% of the variance in stress scores, $b_{\text{cyber}} = .53$, $t(30) = 3.41$, $p = .002$, 95% CI [.73, 2.89], $r_{\text{part}} = .53$, VIF = 1.00.

In contrast, model 4b was not significant, $\Delta R^2 = .00$, $\Delta F(1, 29) = .09$, $p = .766$. Cyber-sexual violence and disclosure helpfulness together predicted only .20% of the variance in posttraumatic stress scores, but the contribution of disclosure helpfulness did not significantly account for additional variance in posttraumatic stress. Cyber-sexual violence significantly uniquely accounted for 24.90% of the variance in posttraumatic stress scores above and beyond the contributions of disclosure helpfulness, $b_{\text{cyber}} = .52$, $t(29) = 3.17$, $p = .004$, 95% CI [.63, 2.91], $r_{\text{part}} = .50$, VIF = 1.07. That is, as the frequency of cyber-sexual violence experiences increases, so do women's ratings of posttraumatic stress. However, disclosure helpfulness was not significant and uniquely predicted only .22% of the variance in stress scores, above and beyond the common contributions of all variables in the model, $b_{\text{disclosure}} = .05$, $t(29) = .30$, $p = .766$, 95% CI [-4.97, 6.68], $r_{\text{part}} = .04$, VIF = 1.07. That is, increases in disclosure helpfulness ratings are not independently related to significant increases in posttraumatic stress scores above and beyond the contributions of all variables in the model.

Overall, the results of the hierarchical multiple regression analyses indicate that the helpfulness or unhelpfulness of disclosure experiences do not significantly add to the prediction of negative emotional states above and beyond the contributions of cyber-sexual violence experiences, which significantly predict depression, anxiety, stress, and posttraumatic stress.

Discussion

This study examined the forms of cyber-sexual violence experienced by undergraduate women attending university campuses in Ontario. The study revealed that various forms of cyber-sexual violence are occurring among university women and are associated with negative symptoms of depression and anxiety, regardless of participants' experiences disclosing the cyber-sexual violence.

Several important findings emerged from this study with regards to experiences of cyber-sexual violence. Firstly, university women reported experiencing a variety of forms of cyber-sexual violence with online gender-based hate speech being the most common, followed by online sexual harassment and cyber-stalking, and the use of a carriage service to arrange their sexual assault being the least commonly reported. This is similar to the pattern of victimization frequency seen with offline forms of sexual victimization (See Statistics Canada, 2006), where typically less invasive forms of victimization such as sexual harassment are more common than more invasive forms such as rape.

With regards to disclosure and reporting practices, over half of women did not disclose their cyber-sexual violence experience. This is similar to findings from offline sexual violence studies, where disclosure is limited (Bachman, 1998; Koss, Gidycz, & Wisniewski, 1987). Furthermore, this is not surprising in light of Canadian legislation, which currently does not recognize many cyber-sexual violence behaviors as criminal offenses. Interestingly, participants' ratings of disclosure helpfulness were not found to be

related to negative emotional states. This is in contrast to some research that has been conducted in this area that finds that negative reactions following sexual assault are associated with negative psychological consequences such as depression, anxiety, posttraumatic stress symptoms, substance abuse (Borja, Callahan, & Long 2006; Campbell, Ahrens, Sefl, Wasco, & Barnes, 2001; Davis, Birckman, & Baker, 1991; Ullman, 1996a, 1996b, 1996c; Ullman & Filipas, 2001; Ullman, Filipas, Townsend, & Starzynski, 2007; Ullman, Starzynski, Long, Mason, & Long, 2008), hostility and fear (Orchowski & Gidycz, 2015), as well as hurt, shame, and rejection (Campbell et al., 2001; Campbell & Raja, 1999). It should be noted that although this study found no impact of negative disclosure experiences on negative symptoms, less than half of the sample disclosed their experiences. These findings are based on a small sample size and there may not have been sufficient power to detect an effect.

The results of this study also demonstrate not only the frequency of occurrence of cyber-sexual violence among university women but its association with their wellbeing. Experiences of cyber-sexual violence were associated with symptoms of depression, anxiety, stress, and PTSD. Furthermore, the greatest percentage of variance accounted for by cyber-sexual violence experiences was seen for PTSD symptoms. Therefore, it may be particularly important for service providers working with this population of women to pay close attention to symptoms of posttraumatic stress. However, it is important to note that in addition to PTSD symptoms being on average above the cut-off for clinical relevance, depression and anxiety scores were also above the normal range for this sample of women.

Conclusion

This study has provided evidence supporting the notion that victimization taking place online may have real and significant implications for women's emotional wellbeing, and is therefore an important step in unraveling the nature of cyber-sexual violence and its impact on young women's lives. Specifically, experiences of sexual victimization appear to be associated with impact on female victims, regardless of whether they take place in a real or virtual world. Furthermore, women who attend universities are surrounded by and must interact with technology almost on a daily basis and are therefore at particular risk of experiencing sexual victimization through the very technologies that should be facilitating their learning. As a result, it is crucial that service providers and legislative initiative begin to adapt to the changing technological nature of crimes against women.

Strengths and limitations of the current research

There are a number of strengths associated with the current research that should be noted. Firstly, the cross-sectional research design used allowed for the examination of multiple associated variables, which is ideal given the various negative symptoms seen with these experiences. Secondly, unlike other studies that have investigated cyber-sexual violence, this research simultaneously examined all forms of cyber-sexual violence that have been discussed in the literature. Lastly, given the novel nature of research investigating cyber-sexual violence this research explored all possible outcomes.

In addition to the strengths of this research there are also a number of limitations to this study. Firstly, the cross-sectional nature of this research did not allow for the examination of causality, only the investigation of associations between variables. For instance, this research leaves open the possibility that another variable could account for the relationship between cyber-sexual violence and negative emotional states. In particular, the current

landscape of the university environment indicates that mental health problems are common among university students in North America (American College Health Association, 2015), which may be a function of other stressors associated with university life such as academic difficulties. Secondly, despite broad recruitment efforts, the sample of women who participated in the study was fairly homogenous, with none of the sample identifying as Black/African Canadian or Aboriginal. This is particularly troubling given the high rates of sexual victimization within these communities (See Bryant-Davis, Chung, Tillman, & Belcourt, 2009; Pearce et al., 2015). With further regards to the generalizability of study results, despite the fact that the study was open to all undergraduate students within Canada, recruitment methods did specifically target universities within a large urban area and results therefore may not be generalizable to undergraduate students attending smaller rural institutions. Thirdly, this research is also subject to the short-coming associated with using self-report data. Specifically, the results of this study may be influenced by social desirability, despite the researcher's attempts to mitigate this through anonymous responding. Fourthly, in an effort to aid participants' understanding, definitions and examples were provided for different forms of cyber-sexual violence. As a result, participants may not have considered all of their cyber-sexual violence experiences when completing the survey. Lastly, this study did not collect information regarding the technologies used by participants (e.g., social networking sites, virtual reality games, cell-phones, etc.) and how often participants accessed these technologies and communication mediums. Therefore, we cannot make inferences regarding the likelihood of cyber-sexual violence victimization or risk factors associated with it.

Future directions

Based on the evidence gained from this study on the association between cyber-sexual violence and depression, anxiety, stress, and PTSD, it will be important for future research to investigate other areas of association, particularly those related to offline sexual victimization such as problem drinking. As this study only investigated participants' psychological functioning one year after the cyber-sexual violence experience, future research should also investigate the potential long-term consequences cyber-sexual violence has on victims. For instance, are there changes in career trajectory for those whose sexually explicit images appear online without their consent? Additionally, it might also be relevant for research to investigate risk factors for experiencing cyber-sexual violence. Anecdotal evidence suggests that women who use dating applications such as Tinder or OkCupid might be at an increased risk of experiencing cyber-sexual violence. Overall, little research has been conducted on characteristics among those who perpetrate cyber-sexual violence (for an exception see Thompson & Morrison, 2013) and risk factors for experiencing cyber-sexual violence such as accessing certain websites or engaging in certain online activities. Lastly, research is also needed addressing potential relationships between online and offline experiences of sexual victimization. Mitchell and colleagues (2011) found a strong correlation between online victimization and offline sexual victimization but the precise nature of this relationship is still unknown.

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