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RESEARCH ARTICLE

Relational aggression in romantic relationships: A study into gender differences, correlates and predictors

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This study examined the role of gender, romantic relational victimization, stress, physical activity, and sleep quality on romantic relational aggression in a sample of young adults (*N* = 371). Findings indicated that women reported using romantic relational aggression more than men, while men were more likely to report being a victim of romantic relational aggression than women. Stress emerged as a positive predictor of romantic relational aggression, explaining most of the variance, while physical activity and romantic relational victimization emerged as negative predictors. Additionally, stress mediated the relationship between physical activity and romantic relational aggression. The present study indicates that stress and physical activity are potential avenues to explore during the development of prevention and intervention protocols.

Keywords: relational aggression, relational victimization, romantic relationship, gender, sleep, stress, physical activity

The presence of aggression in romantic relationships has negative consequences for both the quality and stability of these relationships, as well as the psychological well-being of the individuals involved (Carroll et al., 2010; Linder, Crick, & Collins, 2002; Oka, Brown, & Miller, 2016; Simonelli & Ingram, 1998). Aggression is defined as behaviours which intend to hurt, harm or injure another person (Dodge, Coie, & Lynam, 2006). Physical aggression harms others by inflicting or threatening physical harm (Crick & Grotpeter, 1995; Dodge et al., 2006), as opposed to *relational aggression*, in which relationships serve as the vehicle of harm (Murray-Close, Ostrov, Nelson, Crick, & Coccaro, 2010).

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Relational Aggression

Relational aggression is a non-physical form of aggression whereby the perpetrator's goal is to inflict or threaten damage to relationships (Murray-Close et al., 2010). Relational aggression can present in any type of interpersonal relationship: peer relationships, work relationships, family relationships and romantic relationships (Crothers, Lipinski, & Minutolo 2009; Linder et al., 2002; Reed, Goldstein, Sheffield Morris, & Keyes, 2008). Examples of relational aggression include, intentionally ignoring or excluding an individual from an activity or group interaction, spreading malicious rumours, and defamatory gossip (Crick & Grotpeter, 1995; Goldstein, 2011; Murray-Close et al., 2010). Relational aggression has been associated with a host of internalizing and externalizing problems, which include antisocial behaviour, drug and alcohol abuse, Attention-Deficit/Hyperactivity Disorder (ADHD), depression, anxiety, physical aggression, impaired prosocial behaviour, as well as antisocial and narcissistic personality traits (Aizpitarte, Atherton, Zheng, Alonso-

Arbiol, & Robins, 2018; Crick & Grotpeter, 1995; Keenan, Coyne, & Lahey, 2008; Linder et al., 2002; Marsee, Silverthorn, & Frick, 2005; Ostrov, Kamper-DeMarco, Blakely-McClure, Perry, & Mutignani, 2019; Sullivan, Farrell & Kliewer, 2006).

Romantic Relational Aggression and Victimization

Relational aggression within romantic relationships can manifest in threatening to break-up with a partner should he or she not comply, flirting with others in order to make a partner jealous, or giving a partner the silent treatment when angry (Linder et al., 2002). In terms of prevalence, one study found that 56% of their female participants and 39% of male participants reported perpetration of romantic relational aggression, whereas 59% and 51% of female and male participants, respectively, reported being victim to romantic relational aggression (Ellis, Crooks, & Wolfe, 2009). Both relational aggression and relational victimization, which is defined as the chronic or frequent receipt of relational aggression (Crick & Grotpeter, 1995), have been shown to negatively impact relationship quality, mental health and induce behaviours harmful to health (Coyne et al., 2017; Linder et al., 2002), along with manifestations of maladjustment, such as depression and drug and alcohol abuse (Bagner, Storch, & Preston, 2007). Due to the seemingly high prevalence rates and evidence of the harmful effects of romantic relational aggression, both for victims and perpetrators, this is an issue of high importance which must be urgently addressed.

Despite existing studies, relatively little is known about the development, maintenance and implications of relational aggression and victimization within the context of romantic relationships and whether they manifest differently in men and women (Goldstein, 2011; Goldstein, Chesir-Teran, & McFaul, 2008). Several studies have examined the correlates and predictors of various types of aggression and some of the key correlates identified were victimization, poor sleep quality, high levels of perceived stress, and low levels of physical activity (Johnson, Kotch, Catellier, Windsor, Dufort, Hunter & Amaya-Jackson, 2002; Kamphuis, Meerlo, Koolhaas, & Lancel, 2012; Pels & Kleinert, 2016; Summers & Winberg, 2006). Given the established links between these variables and different types of aggression, it would be reasonable to propose that relational aggression may share these same correlates.

Gender Differences

Previous studies have shown that peer relational aggression in childhood is more commonly exhibited in females than males and that females are more relationally victimized than males (Crick & Bigbee, 1998; Crick, Ostrov, & Kawabata, 2007). In contrast, these gender differences do not appear as salient in late adolescents and adults. In fact, several studies have found no significant gender differences in relational aggression when populations of adults and older adolescents were examined (Bailey & Ostrov, 2008; Burton, Hafetz, & Henninger, 2007; Dahlen, Czar, Prather, & Dyess, 2013; Loudin, Loukas, & Robinson, 2003; Verona, Sadeh, Case, Reed, & Bhattacharjee, 2008), although some other studies have shown that men exhibit greater levels of relational aggression and victimization than women (Linder et al., 2002; Murray-Close et al., 2010). These findings challenge the assumption that relational aggression is predominantly a female trait and suggest that whilst gender differences may exist in children, the picture becomes somewhat less clear in adulthood and late adolescence. Of course, relational aggression in children (directed towards peers) and adults (directed towards their romantic partner) appear in vastly different contexts and therefore cannot be directly compared as they are different, albeit somewhat related, concepts. Altogether, many aspects of previous studies into relational aggression in childhood and early adolescence are likely not to translate to adults; therefore, more research into the gender differences in the presentation of relational aggression in adults is needed.

Perceived Stress

Perceived stress can be conceptualized as “the degree to which a situation in one’s life is appraised as stressful” (Spada, Nikčević, Moneta, & Wells, 2008, p. 1173) and this occurs when an individual deems that situational demands exceed their resources (Ezzati et al., 2013). In other words, perceived stress is the outcome which reflects the global evaluation of the difficulty and significance in dealing with environmental and personal stressors (Spada, et al., 2008). The effect of stress upon aggression has been exemplified by numerous studies (Hennessy & Wiesenthal, 1999; Sprague, Verona, Kalkhoff, & Kilmer, 2011; Summers & Winberg, 2006). However, the vast majority of previous studies have focused on verbal and physical aggression while very few have considered the effect of stress upon relational aggression. A study by Roberti, Harrington and Storch (2006) found a small association between perceived

stress and relational aggression, which they theorized was due to the inherent stress involved in performing relationally aggressive behaviours and coping with relational conflict. Additionally, it is possible that high levels of stress may, in turn, increase levels of frustration and begin to tax an individual's coping resources, leading them to engage in relationally aggressive behaviours. Given the fact that several types of aggression are highly correlated to stress, even from a neurobiological standpoint (Summers & Winberg, 2006), its relationship with romantic relational aggression is a topic which requires further investigation.

Physical Activity

Physical activity can be defined as "any bodily movement… that results in energy expenditure" (Caspersen, Powell, & Christenson, 1985, p. 126) which can be a variety of activities including competitive athletics, leisure time physical activity, and aerobic fitness (Aaron et al., 1995). Physical activity has received widespread attention in the prevention and treatment of various ailments, as it is cost-effective and elicits numerous positive physical and psychological health benefits (Fite & Vitulano, 2011). Studies have shown that engagement in physical activity can result in lower levels of aggression (Fleming et al., 2008; Molnar, Cerda, Roberts, & Buka, 2008; Nelson & Gordon-Larson, 2006). However, the literature appears to lack a consensus with regards to the associations between physical activity and aggressive thoughts and actions. For example, some studies have found a positive relationship with increased physical activity leading to increased aggressive tendencies (Kreager, 2007), some have found a negative relationship with increased physical activity leading to decreased aggressive tendencies (Sinclair, Noronha de Souza, Ward, & Seebacher, 2014), and others have found no significant relationship (Begg, Langley, Moffitt, & Marshall, 1996). Although there is disagreement in the literature regarding the relationship between aggression and physical activity, the majority of studies appear to find a correlation, be it positive or negative. Given the lack of consensus, this study seeks to clarify the relationship between physical exercise and romantic relational aggression.

Sleep Quality

Sleep plays an important role in an individual's physical and psychological wellbeing and being deprived of sleep can dramatically affect an individual's cognitive abilities, general psychological health and their emotional states, such as fear, sadness, and anger (Franzen, Buysse, Dahl, Thompson, & Siegle, 2009; Steptoe, O'Donnell, Marmot, & Wardle, 2008; Walker, 2009). Associations have been found between sleep deprivation and multiple factors related to aggression such as, increased impulsivity, anger, and short-tempered responses (Kahn-Greene, Lipizzi, Conrad, Kamimori, & Killgore, 2006; Kamphuis et al., 2012). Individuals presenting with high trait hostility have been shown to experience poorer quality sleep than their lower trait hostility counterparts (Taylor, Fireman & Levin, 2013). Furthermore, studies have documented improvements in aggressive behaviour following successful treatment of sleep disturbances (Ali, Pitson, & Stradling, 1996; Mitchell & Kelly, 2006). Given the existing evidence, it would logically follow that poor sleep quality may play a role in the presentation and prediction of romantic relational aggression.

The Current Study

The current study aims to investigate potential gender differences in romantic relational aggression and victimization and to examine possible relationships between romantic relational victimization, perceived stress, levels of physical activity, sleep quality, and romantic relational aggression. The presence of relational aggression in romantic relationships can be harmful for both relationship quality and for the health and well-being of the individuals involved (Coyne et al., 2017; Linder et al., 2002). It is therefore imperative to develop prevention and intervention measures to combat this. The current study aims to inform the future development of these measures. Furthermore, some non-physical forms of aggression (i.e., verbal aggression) have been shown, in some cases, to escalate into physical aggression and violence in romantic relationships (Murphy & O'Leary, 1989), which is clearly a highly undesirable outcome. It would be ideal if romantic relational aggression could be stopped before escalating into other forms of aggression (e.g., physical). The majority of studies assessing relational aggression were conducted with school-aged children (Aizpitarte et al., 2018; Crick & Grotpeter, 1995; Ostrov et al., 2019; Prinstein, Boergers, & Vernberg, 2001). However, little is known about whether these variables have utility in understanding relational aggression among young adults in their romantic relationships, as it appears to be an understudied population. Additionally, several previous studies have found links between various types of aggression and victimization, poor sleep quality,

perceived stress, and levels of physical activity (Hennessy & Wiesenthal, 1999; Johnson et al., 2002; Kahn-Greene et al., 2006; Kamphuis et al., 2012; Kreager, 2007; Pels & Kleinert, 2016; Sprague et al., 2011; Summers & Winberg, 2006), although none have examined this combination of variables together. Therefore, these variables were selected based upon previous well-conducted research on aggression which has demonstrated their importance with respect to their associations with other forms of aggression. Selection of these variables as predictors of romantic relational aggression was also made because they are potential variables to target in future research and in the development of intervention protocols (e.g., improving sleep quality, implementing exercise routines, or incorporating stress management techniques).

The current study aimed to answer three key questions regarding relational aggression in young adults' romantic relationships. Firstly, are there gender differences in the levels of romantic relational aggression and victimization? The majority of studies which have assessed gender differences in relational aggression and victimization have found significant differences (Crick & Bigbee, 1998; Crick, Ostrov, & Kawabata, 2007; Linder et al., 2002; Murray-Close et al., 2010). Thus, it was hypothesized that there would be significant gender differences in participants' levels of romantic relational aggression and victimization. However, based on the fact that there are numerous inconsistencies within the current literature, no predictions about the directions of these differences were made.

Secondly, are romantic relational victimization, sleep quality, perceived stress and levels of physical activity correlated with relational aggression in romantic relationships? Several previous studies have found links between various types of aggression and victimization, poor sleep quality, perceived stress, and levels of physical activity (e.g., Hennessy & Wiesenthal, 1999; Johnson et al., 2002; Kahn-Greene et al., 2006; Kreager, 2007; Pels & Kleinert, 2016; Sprague et al., 2011; Summers & Winberg, 2006). Based upon these previous studies, it was hypothesized that these variables would also be correlated with romantic relational aggression. It was also hypothesized that individuals who were relationally victimized in their romantic relationships, with poor quality sleep, high levels of perceived stress, and low levels of physical activity would exhibit higher levels of romantic relational aggression. Finally, what are the relative contributions of romantic relational victimization, sleep quality, perceived stress, and levels of physical activity in the prediction of levels of romantic relational aggression and do these predictors mediate the effects of one another? Based upon findings from existing literature, it was hypothesized that relational victimization, sleep quality, perceived stress and levels of physical activity would have significant predictive ability for romantic relational aggression.

Methods

Participants

The sample consisted of 371 participants between the ages of 18 and 35 who were currently engaged in romantic relationships. The respondents were approximately equal in terms of gender (176 men and 195 women). The majority were either in full-time employment (50.9%), part-time employment (7%) or students (36.7%), with the rest being unemployed (5.4%). The sample population was primarily composed of educated individuals, with 49.3% having obtained a bachelor's degree, 27.2% having obtained a master's degree, and 7.3% having obtained a doctoral degree. The remaining 16.2% of participants had either received lower level education or refused to answer. The inclusion criteria for this study were that participants were between the ages of 18 and 35 and currently involved in a romantic relationship. An a priori sample size estimation for the study was derived using G*Power 3.1 (Faul, Erdfelder, Lang, & Buchner, 2007) and it was estimated that at least 85 participants were required to obtain a medium effect size with a statistical power of 80% and an alpha value of .05.

Measures

Relational aggression and victimization. The Self-Report Measure of Aggression and Victimization (SRMAV; Morales & Crick, 1998) was used to assess participants' levels of relational aggression and victimization. The self-report measure consists of 56 items rated on a 7-point Likert scale from 1 (*not at all true*) to 7 (*very true*) and contains 11 subscales. However, only the two subscales relating to romantic relational aggression (five items) and romantic relational victimization (five items) were used in this study. Subscale scores were derived by calculating the total value of all items, with higher scores indicating higher levels of romantic relational aggression or victimization. Several studies utilizing this measure as a total relational aggression scale have shown acceptable internal consistency (Goldstein et al., 2008; Miller & Lynam, 2003; Schad, Szwedo, Antinishak, Hare, & Allen, 2008). In addition, test-retest reliability, assessed at nine

months, has been found to be excellent for romantic relational aggression (r = .88, p < .001; Murray-Close et al., 2010). The two subscales concerning romantic relational aggression and victimization used in this study had Cronbach's α values of .88 and .69, respectively.

Perceived stress. The Perceived Stress Scale (PSS; Cohen, Kamarch, & Mermelstein, 1983) is a popular self-report instrument for the measurement of psychological stress and has been translated into over 25 different languages (Lee, 2012). The items in the PSS are designed to evaluate the degree to which individuals believe their life has been uncontrollable, unpredictable, and overloaded during the course of the past month. Each item is rated on a scale of 0 (*never*) to 4 (*very often*). These items are general in nature rather than focusing on specific experiences or events. This study utilizes the 10-item scale (PSS-10), which, in a recent review (Lee, 2012), was shown to have a Cronbach's α of > .70 in all 12 studies analysed, the test-retest reliability (ranging from two days to six weeks) was also evaluated at > .70 in all cases. The Cronbach's α value in this sample was .91.

Physical activity. The General Practice Physical Activity Questionnaire (GPPAQ; Foster, 2009) is intended for use in adults (16-74 years) and is widely used in routine general practice reflecting an individual's current physical activity (Ahmad et al., 2015). The GPPAQ consists of: 1 item (*employment-related physical activity*) ranked from 0 (*I am not in employment*) to 4 (*My work involves vigorous physical activity*); 5 items (*leisure-related physical activity*) ranked from 0 (*none*) to 3 (*3 hours or more*); and 1 item (*walking pace*) ranked from 0 (*slow pace*) to 3 (*fast pace*). Total scores were calculated by addition of the scores for the individual items. The GPPAQ is a relatively new addition to the general practice. It was commissioned in 2006 by The Department of Health and Social Care and currently forms part of routine National Health Service (NHS) health checks (Foster, 2009). The GPPAQ has been shown to offer good face and construct validity and reliability (Ahmad et al., 2015; Foster, 2009).

Sleep quality. The Pittsburgh Sleep Quality Index (PSQI; Buysse, Reynolds, Monk, Berman, & Kupfer, 1989) is perhaps the most widely used self-report measure for assessing sleep quality (Hinz et al., 2017). It consists of 5 time-related items and 14 items ranked from 0 (*not during the past month*) to 3 (*three or more times a week*) and 7 clinically relevant domains of sleep difficulties (Kamphuis, Dijk, Spreen, & Lancel, 2014). A global score of sleep quality can be derived by addition of the scores in each of these domains, resulting in scores ranging from 0 to 21. Global scores exceeding 5 are generally considered to indicate poor quality sleep. Psychometric properties of the PSQI have been examined extensively in numerous studies seeking to evaluate validity (Buysse et al., 2008; Hinz et al., 2017; Nishiyama et al., 2014), internal consistency (Beaudreau et al., 2012), test-retest reliability (Backhaus, Junghanns, Brooks, Riemann, & Hohagen, 2002), and factorial structure (Burkhalter et al., 2010; Mariman et al., 2012). The Cronbach's α value in this sample was .77.

Procedure

Ethical approval was obtained for this study from the University of Edinburgh Research Ethics Committee. Data were collected by means of online self-report questionnaires delivered through the Bristol Online Survey Tool. Links to the survey were circulated to staff and students within the School of Health and Social Sciences at the University of Edinburgh and links were also advertised on several social media platforms and British student forums. The survey was open to all potential participants and participation in the study was voluntary, and no reward, monetary or otherwise, was offered for completion of the survey. All participants were informed that their participation was voluntary and anonymous, and all provided consent to participate.

Prior to completion of the survey, participants were asked to read a participant information page, which included; a brief explanation of the study being conducted, details of the procedure, contact details (for further information, complaints, etc.), an outline of the expected time commitment, details of participant rights, and a statement referring to the confidentiality/anonymity of the data collected. Following this information page, participants were required to provide informed consent by ticking a box signalling that they agreed to continue to the survey. Participants then proceeded to complete the questionnaires, which were administered in the same order to all participants. The entire survey took approximately 20 minutes to complete and, after submitting their responses, participants were directed to a debriefing page.

Results

Quantitative data analysis was conducted using IBM SPSS

24. Data were assessed for normality of distribution with the aid of normal quantile-quantile (Q-Q) and box plots and the Kolmogorov-Smirnov test. These tests indicated that data pertaining to relational aggression, $D(325) = .20$, $p < .001$, relational victimization, $D(325) = .20$, $p < .001$, sleep quality, $D(325) = .14$, $p < .001$, perceived stress, $D(325) = .12$, $p < .001$, and physical activity, $D(325) = .11$, $p < .001$, were significantly non-normal. Mann-Whitney U tests were conducted to test for potential gender differences, and it was found that women reported significantly greater levels of romantic relational aggression (*Median* = 11.0) than men (*Median* = 8.00), $U = 20208$, $z = 2.99$, $p = .003$, $r = .16$. However, men were found to report greater levels of romantic relational victimization (*Median* = 11.0) than women (*Median* = 6.00), $U = 11553$, $z = -5.55$, $p < .001$, $r = -.29$. Thus, descriptive data and correlational data are reported by gender (Tables 1 and 2).

In both genders, romantic relational aggression was significantly positively correlated with perceived stress, poor sleep quality, and negatively correlated with levels of physical activity. For romantic relational victimization, there are a few notable differences between male and female participants. In men, romantic relational victimization was significantly positively correlated with romantic relation aggression and perceived stress (Table 1). In women, romantic relational victimization was positively correlated with poor sleep quality and negatively correlated with physical activity (Table 2).

To investigate the relative contributions of gender, romantic relational victimization, perceived stress, poor sleep quality, and levels of physical activity in the prediction of romantic relational aggression, a hierarchical regression analysis was performed. Initially, the assumptions of multiple linear regressions were tested. Since significant correlations were found between the variables, the possibility of multicollinearity was considered. Variance Inflation Factor (VIF) scores were well below 10 and tolerance scores well above 0.2, indicating no evidence of collinearity. The assumption of independent errors, as assessed by the Durbin-Watson statistic, was shown to have been met. In addition, examination of a plot of standardized residuals against standardized predicted values revealed a pattern indicative of a situation in which the assumptions of homoscedasticity and linearity had been met. To test the normality of residuals, a normal probability plot and a histogram were generated – both of which suggested that the residuals were normally distributed. The case wise diagnostics were analysed and the standardized residuals were examined. It was found that in excess of 95% of cases had standardized residuals within ±2 standard deviations. In addition to this, none of the cases had a Cook's distance greater than 1, supporting the indication that none of the cases had an undue influence upon the model. Due to the previously observed gender differences, the analysis was controlled for gender in step 1 - gender was recoded as a dummy variable (i.e., 0 = *men*

Table 1. Means (M), Standard Deviations (SD) and Correlations among the main study variables for men (n = 176)

Measure	1.	2.	3.	4.	M	SD
1. Romantic relational aggression	-				12.40	9.12
2. Romantic relational victimization	.23**	-			12.30	7.15
3. Perceived stress	.61**	.24**	-		17.50	11.00
4. Physical activity	-.49**	-.04	-.54**	-	8.47	3.87
5. Poor sleep quality	.64**	.10	.58**	-.44**	5.45	3.58

Note. *p<.05, **p<.01

Table 2. Means (M), Standard Deviations (SD) and Correlations among the main study variables for women (n = 195)

Measure	1.	2.	3.	4.	M	SD
1. Romantic relational aggression	-				15.00	10.40
2. Romantic relational victimization	.01	-			8.81	5.38
3. Perceived stress	.79**	.02	-		20.20	11.00
4. Physical activity	-.56**	-.15*	-.52**	-	8.37	3.49
5. Poor sleep quality	.43**	.15*	.45**	-.39**	5.75	3.17

Note. *p<.05, **p<.01

and 1 = *female*). In step 2 of the hierarchical regression model, romantic relational victimization was included. Step 3 included perceived stress, step 4 included physical activity and finally, step 5 included sleep quality. In the first step of independent variables (Table 3), gender was significantly associated with romantic relational aggression, suggesting that women were more likely to report perpetrating romantic relational aggression than men. Romantic relational victimization, perceived stress, and physical activity emerged as predictors of romantic relational aggression, with perceived stress accounting for the largest amount of the variance and acting as a positive predictor. Romantic relational victimization and physical activity acted as negative predictors, although romantic relational victimization explained very little of the variance. Interestingly, sleep quality did not exhibit any statistically significant predictive ability for romantic relational aggression.

Because physical activity and perceived stress were the strongest predictors of romantic relational aggression and together explained most of the variance, mediation analysis was conducted. The mediation analysis revealed that the relationship between physical activity and romantic relational aggression was mediated by perceived stress. There was a significant indirect effect of physical activity on romantic relational aggression through perceived stress, b = -.896, 95% CI [-1.11, -.699]. Physical activity negatively predicted perceived stress b = -1.57, p < .001 and in turn, perceived stress predicted romantic relational aggression, b = 0.569, p < .001. After having accounted for the mediating effect of perceived stress, physical activity was still observed to have a significant impact upon romantic relational aggression, b = -.377, p = .001.

Discussion

The present study examined the effects of gender, romantic relational victimization, perceived stress, physical activity, and sleep quality on romantic relational aggression. Significant gender differences in the presentation of romantic relational aggression and victimization were found: women reported greater levels of romantic relational aggression than men and men reported greater levels of romantic relational victimization compared to women. Furthermore, in line with our directional hypotheses, high levels of perceived stress and low levels of physical activity both predicted romantic relational aggression although, surprisingly, sleep quality did not. Contrary to our predictions, romantic relational victimization was a negative

Table 3. Hierarchical regression analysis for variables predicting romantic relational aggression (N = 371)

	Variable	B	SE B	β	R^2	ΔR^2
Model 1	Gender	2.60	1.02	.13*	.02*	.02*
Model 2	Gender	2.62	1.03	.13*	.02*	.00
	Victimization	.01	.08	.00		
Model 3	Gender	.40	.74	.02		
	Victimization	-.13	.07	-.09*	.51**	.49**
	Perceived Stress	.64	.04	.71**		
Model 4	Gender	.58	.72	.03		
	Victimization	-.12	.07	-.08*	.53**	.02*
	Perceived Stress	.57	.05	.64**		
	Physical Activity	-.37	.15	-.14*		
Model 5	Gender	.59	.71	.03		
	Victimization	-.12	.07	-.08*		
	Perceived Stress	.56	.05	.63**	.53**	.00
	Physical Activity	-.36	.16	-.14**		
	Sleep Quality	.07	.17	.02		

Note. *p<.05; **p<.01

predictor of romantic relational aggression. Further analysis unveiled a mediating effect of perceived stress upon the relationship between physical activity and romantic relational aggression. The findings of the present study have signalled a number of possible avenues for future research, as well as providing important information, which could form the basis of novel prevention and intervention measures for romantic relational aggression.

Examination of gender differences within the context of romantic relational aggression and victimization showed that women reported significantly greater levels of relational aggression in their relationships than men. This result would appear to be consistent with several studies assessing peer relational aggression in children and adolescents (Crick & Grotpeter, 1995; Crick, Ostrov, & Kawabata, 2007), suggesting that the gender differences may continue into adulthood and may cross over into romantic relationships later in life (Coyne et al., 2017). This is a finding in line with that of Goldstein et al. (2008), who also found that the use of relational aggression was significantly greater in women than men in young adults' romantic relationships. This finding may be due to gender differences in the reporting of romantic relational aggression: men may simply be less likely than women to report their relationally aggressive behaviour. Alternatively, it may be that men engage in other forms of aggressive behaviour for example, physical or verbal (Orkibi & Ronen, 2019). Additionally, the results of the present study indicate that men experienced romantic relational victimization to a significantly greater degree than women, a finding consistent with that obtained by both Linder et al. (2002) and Goldstein et al. (2008).

The most significant contributor to the prediction of romantic relational aggression was high levels of perceived stress. This suggests that high levels of perceived stress may act as a risk factor for romantic relational aggression and supports the theory that aggressive behaviours are greater during periods of stress (Bodenmann, Bradbury, & Ledermann, 2010). However, it has not been ascertained whether high levels of perceived stress are due to romantic relational aggression or whether they are the cause of it. However, as a link has now been established, this opens avenues for further exploration. For example, these findings may be important for the development of methods to reduce relational aggression within romantic relationships, perhaps by teaching stress management techniques.

The second most significant predictor of romantic relational aggression was low levels of physical activity, supporting the theory that engaging in physical activity may make an individual less prone to relationally aggressive behaviours. This finding is supported by the evidence in the current literature, which shows a reduction in aggressive behaviours with increased physical activity (Fleming et al., 2008; Molnar et al., 2008; Nelson & Gordon-Larson, 2006). This may indicate that physical activity could act as a protective factor against relational aggression and that perhaps introducing targeted programs to increase physical exercise may offer an additional way of minimizing the presentation of romantic relational aggression. However, it is equally plausible that physical activity may simply be a marker of psychological adjustment and that those who are more physically active are less likely to behave aggressively because they are better able to regulate their emotions and behaviour. The mediating effect of perceived stress upon the relationship between physical activity and romantic relational aggression may also indicate that those who are physically active are less stressed and are thus less likely to perform relationally aggressive actions in the context of their romantic relationships.

Although explaining very little unique variance in the regression model, romantic relational victimization acted as a negative predictor of romantic relational aggression. This suggests that individuals who are relationally victimized in their romantic relationships are less likely to use relational aggression in these relationships. This was in contrast to our predictions and to previous research investigating other forms of aggression (Johnson et al., 2002), and perhaps suggests that relationally aggressive behaviours are not used as a defense mechanism by a victim to retaliate against their aggressor; rather, in a couple, one person acts as a victim and the other as the aggressor.

Sleep quality was not a predictor of romantic relational aggression, which is in contrast to previous studies investigating the effect of sleep quality upon other forms of aggression (Kahn-Greene et al., 2006; Kamphuis et al, 2012). However, a number of these previous studies focused on the use of experimental sleep deprivation as a metric of sleep quality, not simply measuring baseline sleep quality. Additionally, several previous studies which have analysed the associations between sleep quality and aggression have assessed the relationship between aggression and poor sleep quality due to medical conditions such as obstructive sleep apnoea (Mitchell & Kelly, 2006) or substance use

disorder (Haynes et al., 2006). From the results of the current study, it appears that an individual's long-term sleep quality has no significant influence upon apparent levels of romantic relational aggression.

Two limitations of the present study should be considered in future research. Firstly, causal relationships cannot be inferred from the results of the present cross-sectional study. It may be important for future work to study similar topics in a longitudinal fashion, in order to better understand the causes and underlying factors of relational aggression within romantic relationships. Secondly, the findings of this study were based entirely upon self-reported data, using only one respondent. In future research, it may be important to include partner reports, which would allow for examination of relational aggression in romantic relationships at the dyadic level. Although the variance explained by the final model was high, it indicates that other variables not included in the study are important in the understanding of romantic relational aggression. For example, data concerning sexuality, relationship length and perceived relationship quality were not collected in this study and should be considered in future studies

The results of the present study contribute to the limited body of research on romantic relational aggression, confirming that young adults do indeed engage in romantic relational aggression. This, coupled with results from previous studies, which report the harmful nature of relational aggression, is cause for alarm and should prompt further research as well as development and implementation of measures to reduce the harmful influence of relational aggression within romantic relationships. Gender differences in the presentation of romantic relational aggression and victimization were identified, however, more research is needed to confirm our findings, possibly using different measures. Furthermore, this study provides clear evidence that high levels of perceived stress and low levels of physical activity are predictors of relational aggression in romantic relationships and that stress moderates the effect of physical activity upon romantic relational aggression. The findings reported in this study highlight the potential importance of implementing stress management techniques in an effort to reduce romantic relational aggression.

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Conflicts of Interest

The authors have no conflicts of interest to declare.

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