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Daily Peer Hassles and Non-Suicidal Self-Injury in Adolescence: Gender Differences in Avoidance-Focused Emotion Regulation Processes

Abstract

This study aimed to examine the mediating role of rumination, experiential avoidance, dissociation and depressive symptoms in the association between daily peer hassles and non-suicidal self-injury among adolescents. Additionally, this study explored gender differences in these associations and tested whether the proposed model was invariant across genders. The sample consisted of 776 adolescents, of them 369 are males (47.6%) and 407 are females (52.4%), aged between 12 and 18 years old from middle and high schools in Portugal. Participants completed self-report questionnaires to assess daily peer hassles, rumination in its severe component (i.e., brooding), experiential avoidance, dissociation, depressive symptoms and non-suicidal self-injury. Path analysis showed that daily peer hassles indirectly impact on non-suicidal self-injury through increased levels of brooding, experiential avoidance, dissociation, and depressive symptoms. Results indicated significant gender differences in mean scores and path analysis. Male adolescents were more likely to engage in brooding and experiential avoidance in response to external distress (particularly, daily peer hassles), whereas female adolescents were more likely to engage in non-suicidal self-injury in response to internal distress (particularly, depressive symptoms). These findings suggest relevant preventive and intervention actions to address emotion dysregulation in adolescence, by teaching them acceptance and mindfulness skills as a way of coping with stressful experiences and internal distress.

Keywords: Adolescence; Depression; Dissociation; Experiential Avoidance; Gender Differences; Non-Suicidal Self-Injury; Rumination.

Introduction

Non-suicidal self-injury (NSSI) is highly prevalent among adolescents and is associated with several psychological impairments and augmented risk for future suicide (Klonsky, May, & Glenn, 2013). NSSI refers to a deliberate and direct destruction of one's body tissues for non-socially sanctioned reasons without suicidal intent (American Psychiatric Association, 2013). Previous studies found prevalence rates ranging between 10% and 40% in community samples of adolescents and an onset age for NSSI ranging between 12 and 16 years old (Klonsky, Muehlenkamp, Lewis, & Walsh, 2011; Nock, 2010). Regarding gender differences there are mixed results, still there is a general trend in finding that female adolescents report engaging more frequently in NSSI (Bresin & Schoenleber, 2015; Klonsky et al., 2011).

Although several distal risk factors have been identified in the development of NSSI, including family environment, early life events and temperament, there are proximal vulnerabilities that may trigger and maintain NSSI. Among these proximal factors, daily life hassles may play a prominent role. Daily hassles are the frustrating and irritating everyday experiences that occur during transactions with the environment (e.g., family, peers, school and neighborhood; Seidman et al., 1997). Daily life hassles are common chronic stressors that affect individuals' psychological adjustment (Pinquart, 2009). Research conducted in samples of adolescents showed that daily life hassles are associated with maladaptive cognitive emotion regulation strategies (Garnefski, Boon, & Kraaij, 2003), depressive symptoms, substance use (Bailey & Covell, 2011) and suicidal ideation (Mazza & Reynolds, 1998). Recently, some studies found that high levels of current life stressors prospectively predict NSSI (Hankin, & Abela, 2010; Liu et al., 2014), especially interpersonal stressors (Guerry & Prinstein, 2010; Jutengren, Kerr, & Stattin, 2011). Given that the transition to adolescence is mainly characterized by a shift in social affiliation from family to peer approximation (Steinberg & Morris, 2001), stressful experiences in peer group may be a source of stress for adolescents. For instance, when experiencing negative emotional states, adolescents who perceived moderate and high levels of daily peer hassles are more likely to engage in NSSI (Xavier, Cunha, & Pinto-Gouveia, 2016a). According to Nock (2010), when exposed to stressful life events, individuals who experience both physiological hyperarousal activation and difficulties in emotion regulation may be particularly at risk for engaging in NSSI as a maladaptive coping strategy. Such predisposing characteristics may include poor interpersonal problem-solving skills (Nock & Mendes, 2008), rumination (Hilt, Cha, & Nolen-Hoeksema, 2008) and self-criticism in its most severe form –

hated self (Xavier, Pinto-Gouveia, & Cunha, 2016). It seems that the way individuals respond to stress through mal-adaptive emotion regulation processes may increase depressive symptoms and dysfunctional behavior patterns (Garnefski et al., 2003; Nolen-Hoeksema, 2012). Specifically, avoidance-focused emotion regulation processes, namely rumination, experiential avoidance and dissociation, may be key mediating psychological mechanisms in the relationship between daily peer hassles and depressive symptoms and NSSI.

Rumination is a response to distress that involves the tendency to brood and reflect on “the symptoms of depression and on the causes, meanings, and consequences of those symptoms” (Nolen-Hoeksema, 1991, p.569) and has been found to exacerbate and prolong depressive symptoms in adolescence (Abela & Hankin, 2011). Female adolescents tend to endorse higher levels of ruminative response style than male adolescents and this trend may help to explain gender differences in depression during adolescence (Nolen-Hoeksema, 2001). According to Treynor et al. (2003), rumination is a multi-dimensional construct that may be distinguished between harmful and helpful sub-types of ruminative thought (brooding versus reflection). Indeed, rumination is considered a maladaptive cognitive emotion regulation strategy, especially when it takes the form of brooding (Nolen-Hoeksema, Wisco, & Lyubomirsky, 2008; Treynor et al., 2003), as it is implicated on several aspects of both mental and physical health (Smith & Alloy, 2009). Moreover, rumination may function as an avoidant coping strategy, as individuals may avoid dealing with emotionally threatening material through rumination, albeit doing so increases their negative affect (Giorgio et al., 2010; Smith & Alloy, 2009). Ruminative response style has been associated with NSSI (Hoff & Muehlenkamp, 2009) and serves both as a moderator and mediator variable. For instance, rumination had a moderator effect in the relationship between depressive symptoms and NSSI among female early adolescents (Hilt et al., 2008). Selby, Connell, and Joiner (2010) found a significant interaction between rumination and painful or provocative life events to explain NSSI among college students. A recent study showed that ruminative thinking is an underlying mediator mechanism in the association between stressful life events and psychological distress and NSSI among adolescents (12-18 years-old; Voon, Hasking, & Martin, 2014).

Another transdiagnostic process that may be implicated in the development and maintenance of psychopathology is experiential avoidance (EA). EA is defined as the “phenomenon that occurs when a person is unwilling to remain in contact with particular private experiences and takes steps to alter the form or frequency of these events and the contexts that occasion them” (Hayes, Wilson, Gifford, Follette,

& Strosahl, 1996; p. 1154). NSSI may be included in the broader class of experiential avoidance behaviors, as it is usually served the purpose of escaping, managing and regulating emotions, resulting in a temporary emotional relief, but leading to long-term impairments (Chapman et al., 2006). Various studies conducted with adult populations suggest that EA may serve as a mediator of the impact of stressful events on poor outcomes (e.g., Biglan, Hayes, & Pistorello, 2008). For example, aversive and shaming experiences in childhood and adolescence are associated with increases in EA, which in turn will affect psychopathology (e.g., depressive symptoms; Carvalho, Dinis, Pinto-Gouveia, & Estanqueiro, 2015). Although empirical research are still scant, a few studies on EA during adolescence showed that female adolescents tend to report more levels of experiential avoidance than male adolescents (Biglan et al., 2015; Greco, Lamber, & Bayer, 2008; Howe-Martin, Murrell, & Guarnaccia, 2012). Regarding correlational studies conducted with adolescents' community samples, EA has been associated with anxiety, depressive symptoms, social comparison (Cunha & Santos, 2011) and lower quality of life (Greco et al., 2008). Moreover, EA is longitudinally associated with depressive symptoms and is more likely in adolescents who report family conflicts (Biglan et al., 2015). Other study found that adolescents with a history of NSSI and other functionally equivalent behaviors (e.g., eating disturbance, substance abuse) reported more chronic experiential avoidance than those who reported not engaging in those behaviors (Howe-Martin et al., 2012). Furthermore, EA predicted severity of borderline symptoms at 1-year follow-up, controlling for baseline levels of borderline, anxiety and depressive symptoms (Sharp, Kalpakci, Mellick, Venta, & Temple, 2015). Studies on the mediating role of EA in adolescence are still lacking, but two studies have found that EA exert an indirect effect between stressful experiences (e.g., child maltreatment; daily school and peer hassles) and psychopathology (e.g., depression, PTSD symptoms) (Shenk, Putnam, & Noll, 2012; Xavier, Pinto-Gouveia, & Cunha, 2015).

Dissociation refers to the avoidance of reality, to a deficit in accessibility to memory and knowledge, and in the integration of behavior and sense of the self (American Psychiatric Association, 2013), often in response to severe traumatic events. Alternatively, EA is a broader construct, transversal to specific emotional regulation strategies, because it does not focus on a specific form of action nor on a particular response, but rather on the function of emotion regulation (Boulanger, Hayes, & Pistorello, 2010; Hayes et al., 1996; Kashdan, Barrios, Forsyth, & Steger, 2006). There is a paucity of empirical studies that examine the relationship between dissociation and EA. An exception is the study in adult population conducted by Marx and Sloan (2005) demonstrating that peritraumatic dissociation and

experiential avoidance were significantly related to each other, and this last one significantly predicted the severity of PTSD symptomatology. Dissociative experiences are commonly psychological responses aiming at coping with severe trauma (Putman, 1996) and are frequently associated with other mental health difficulties (e.g., post-traumatic stress disorder, attention deficits) (e.g., Ozdemir, Boysan, Ozdemir, & Yilmaz, 2015). Furthermore, there is empirical evidence that dissociation mediates the relationship between trauma experiences (e.g., child maltreatment) and psychopathology, including NSSI (e.g., Rallis, Deming, Glenn, & Nock, 2012; Swannell et al., 2012). These studies suggest that previous trauma and current stress may trigger dissociative experiences into avoiding intolerable emotions, thoughts and memories, which in turn may lead to NSSI as a way to escape from unpleasant states of dissociation, numbness or emptiness (Chapman et al., 2006; Klonsky, 2007; Rallis et al., 2012).

Considering this theoretical and empirical background, the present study tests a model with multiple mediators where emotion dysregulation processes, such as rumination (specifically brooding component), experiential avoidance and dissociation, function as mediators on the relationship between daily peer hassles and psychopathology (particularly, depressive symptoms and NSSI). More specifically, the current study aims to test a hypothesized model in which daily peer hassles would impact on NSSI through avoidance-focused emotion regulation processes (namely, brooding, experiential avoidance and dissociation) and depressive symptoms. In the same model, it is tested whether these avoidance-focused emotion regulation processes would impact upon NSSI through depressive symptoms. Furthermore, the current study also aims to test whether this explanatory model of NSSI is equal or vary across gender. We hypothesized that adolescents who perceived greater daily hassles with their peers are more likely to brood, avoid and dissociate and experience depressive symptoms, which in turn impacts upon NSSI. We also expected that the effect of daily peer hassles on depressive symptoms occurs through rumination, EA and dissociation. Additionally, it was hypothesized that avoidance-focused emotion regulation processes are associated with NSSI through their effect on depressive symptoms. Given the theoretical conceptualizations on gender differences of emotion regulation in adolescence (e.g., Nolen-Hoeksema, 2001, 2012), we hypothesized that the associations between daily peer hassles, rumination, EA, dissociation, depressive symptoms and NSSI would differ for adolescent males and females.

Method

Participants

The sample included 776 adolescents, of them 369 are males (47.6%) and 407 are females (52.4%). Participants are aged between 12 and 18 years old ($M = 14.55$, $SD = 1.76$) and were recruited from 7th to 12th grade in middle and secondary schools (mean of years of education = 9.45, $SD = 1.61$) in Portugal. No gender differences were found for age, $t_{(774)} = 1.069$, $p = .286$, but significant gender differences existed for years of education, $t_{(774)} = 2.417$, $p = .016$. Female adolescents had more years of education ($M = 9.58$, $SD = 1.63$) than male adolescents ($M = 9.30$, $SD = 1.58$).

Results from G*Power calculations for correlations, t-test and linear multiple regression analyses, assuming a p value = 0.05, an effect size of $f = 0.15$, with a statistical power of 0.95, recommend a sample size ranging from 89 to 210.

Procedure

The sample recruitment was through non-probability sampling method, i.e. convenience sample. Nevertheless, participants were recruited from seven different independent schools. After obtaining ethical approvals from Portuguese Commission for Data Protection and Ministry of Education, schools in the central region of Portugal were contacted to participate in the study. The Head Teacher and the parents were informed and gave written consent. All adolescents enrolled in the study were fully informed about the goals of the study and the aspects of confidentiality. Adolescents consented to participate and filled out voluntarily the instruments in the classroom in the presence of the teacher and researcher. The researcher provided clarifications about the questionnaires when requested. Participants who did not want to participate or were not authorized by their parents to participate in this study were given an academic task by the teacher in the classroom.

Measures

The **Daily Hassles Microsystem Scale (DHMS)**; Seidman et al., 1995; Portuguese version: Paiva, 2009) is a self-report questionnaire composed by 25 items that assess the perceived daily hassles within four microsystems. Respondents answer to each event how much of hassles it was in the last month on a 4-point scale (1 = *not at all a hassles*; 4 = *a very big hassles*). In the present study only *peer hassles subscale* was used, which represents troubles and conflicts with friends (4 items; e.g., “Trouble with friends over beliefs, opinions and choices.”; “Being left out of activities or ignored by other kids.”). In the original study (Seidman et al., 1995) the daily peer hassles subscale had an adequate internal

consistency ($\alpha = .71$). In the current study the internal consistency for daily peer hassles subscale was also adequate ($\alpha = .72$).

The **Ruminative Responses Scale – short version (RRS)**; Treynor, Gonzalez, & Nolen-Hoeksema, 2003; Portuguese version for adolescents: Xavier, Cunha, & Pinto-Gouveia, 2016b) is a 10-item scale that measures the individual's tendency to ruminate when in a sad or depressed mood. Originally designed for adults, the RRS has been administered in prior studies to adolescents, demonstrating good psychometric properties in youngster population. In the current study only brooding subscale (5 items) was used to assess the passive and judgmental pondering of one's mood because it is considered the maladaptive component of rumination. Each item is rated on a 4-point scale (1= *almost never* to 4= *almost always*). In the original version, the Cronbach's alpha for brooding subscale was .77 (Treynor et al., 2003). This subscale also had adequate internal consistency in adolescents' sample ($\alpha = .80$; Xavier et al., 2016b). In the current study the brooding subscale presented a Cronbach's alpha of .80.

The **Avoidance and Fusion Questionnaire for Youth (AFQ-Y)**; Greco, Lambert, & Baer, 2008; Portuguese version: Cunha & Santos, 2011) is a 17-item self-report questionnaire that was based on Acceptance and Commitment Therapy's model to assess psychological inflexibility through cognitive fusion (e.g., "My thoughts and feelings mess up my life.") and experiential avoidance (e.g., "I push away thoughts and feelings that I don't like"). Items responses are rated on a 5-point scale (0 = *not at all true*; 4 = *very true*). The AFQ-Y is a unidimensional scale, with higher total scores indicating higher experiential avoidance/cognitive fusion. Greco et al. (2008) found good internal reliability ($\alpha = .90$). The Portuguese version also found adequate internal consistency ($\alpha = .82$). In the current study the AFQ-Y presented a Cronbach's alpha of .89.

The **Adolescent Dissociative Experiences Scale-II (A-DES-II)**; Armstrong, Putnam, Carlson, Libero, & Smith, 1997; Portuguese version: Espirito-Santo, Lopes, Simões, Cunha, & Lemos, 2014) is a 30-item self-report questionnaire that assesses dissociative experiences. The A-DES-II items can be grouped into four domains reflecting basic aspects of dissociation (experiences of dissociative amnesia; absorption and imaginative involvement; passive influence; and depersonalization and derealization) and can be used as a total score. Each item is rated on 11-point scale (from 0 = *never* to 10 = *always*) and higher scores representing high levels of dissociative experiences. Armstrong et al., (1997) found a Cronbach's alpha of .93 for the total score. In the present sample the Cronbach's alpha was .94.

The **Depression Anxiety and Stress Scales (DASS-21)**; Lovibond & Lovibond, 1995; Portuguese version: Pais-Ribeiro, Honrado, & Leal, 2004) is a self-report measure composed of 21 items to assess symptoms of depression, anxiety and stress. The items indicate negative emotional symptoms and are rated on a 4-point scale (0-3) during the last week. Lovibond and Lovibond (1995) found the subscales to have high internal consistency ($\alpha = .91$ for depression; $\alpha = .84$ for anxiety; $\alpha = .90$ for stress). In the present study only the depression subscale (7 items) was used and presented good internal consistency ($\alpha = .90$).

The **Risk-taking and Self-harm Inventory for Adolescents (RTSHIA)**; Vrouva, Fonagy, Fearon, & Roussow, 2010; Portuguese version: Xavier, Cunha, Pinto-Gouveia, & Paiva, 2013) is a self-report questionnaire that assesses simultaneously risk-taking and self-harm behaviors. In the present study only the Self-harm dimension was used to measure the frequency of intentional self-injury behaviors (e.g., cutting, burning or biting). The items are rated on a 4-point scale (0 = *never*; 3 = *many times*), referring to the lifelong history. There is also one categorical item to assess the absence or presence of NSSI, following by a question about the part(s) of the body that were deliberately injured and a question about when it happened (in the last month; in the last three months; and more than three months), if applicable. In the present study, items 32 and 33, which assess suicidal ideation and intent respectively, were not included in the overall sum of NSSI and prior to analyses four respondents were excluded from data set because they reported suicidal intent. Vrouva et al. (2010) found a good internal consistency for self-harm dimension ($\alpha = .93$). In the current study the self-harm dimension (15 items) presented a good internal reliability ($\alpha = .88$).

Data Analyses

Statistical analyses were performed using PASW Software (Predictive Analytics Software, version 18, SPSS, Chicago, IL, USA) and AMOS Software (Analysis of Moment Structures, version 18, AMOS Development Corporation, Crawfordville, FL, USA). Descriptive statistics were computed to analyze demographic variables and means scores on all variables. Gender differences were tested using independent-samples t-tests (Field, 2013). Pearson product-moment correlation coefficients were performed to explore the relationships between all variables in the study (Field, 2013).

Path analysis was performed to estimate the presumed relations among variables in the proposed theoretical model. This technique from structural equation modelling (SEM) considers theoretical causal

relations among variables that have already been hypothesized (Kline, 2005). In the path model tested, it was examined whether daily peer hassles would impact upon the frequency of non-suicidal self-injury (NSSI), mediated by brooding, experiential avoidance (EA), dissociation and current depressive symptoms. Additionally, it was tested whether brooding, EA and dissociation would impact upon NSSI, mediated by depressive symptoms. The Maximum Likelihood (ML) estimation method was used (Kline, 2005). The following goodness-of-fit indexes were analyzed to evaluate overall model fit: Goodness of Fit Index ($GFI \geq .95$, good), Comparative Fit Index ($CFI \geq .95$, good), Tucker-Lewis Index ($TLI \geq .95$, good), Root Mean Square Error of Approximation ($RMSEA \leq .05$, good fit; $\leq .08$, acceptable fit; $\geq .10$, poor fit), with 95% confidence interval (CI) (Hu & Bentler, 1999). Significance tests of indirect effects were performed using Bootstrap sampling with 2000 samples and bias-corrected confidence levels set at .95 (Hayes & Preacher, 2010; Kline, 2005).

A multi-group analysis was performed to test whether path coefficients in the model are equal or invariant for groups (i.e., males vs. females) (Byrne, 2010). The comparison between the unconstrained model (i.e., with free structural parameter coefficients) and the equality constrained model (i.e., where the parameters are constrained equal across groups) was analyzed through the chi-square difference test statistic (Byrne, 2010). The critical ratio difference method provided by AMOS software was calculated to test for differences between male and female adolescents among all parameter estimates and critical ratio values larger than 1.96 indicate a significant difference between genders on the corresponding parameter (Byrne, 2010).

Results

Data were screened for univariate normality and there were no severe violations to normal distribution ($|Sk| < 3$ and $|Kul| < 8-10$; Kline, 2005). To inspect for possible multivariate outliers Mahalanobis Distance squared (D^2) were used and some extreme observations were excluded (6 cases considered as outliers). Missing data at random were minimal (less than 5% of cases) and the regression imputation method available in AMOS software was used. This approach for handling incomplete data has shown satisfactory performance (Schafer & Graham, 2002). All analyses were performed with the completed data from the participants. Multicollinearity was examined by inspecting the tolerance and variance inflation factor ($VIF < 5$) and no multicollinearity problems were found among variables (Kline, 2005).

History of NSSI

In the current sample, approximately 22% of the adolescents reported engaging in NSSI at least once in their lifetime ($n = 171$) and of them 19% revealed engaging in NSSI in the last month ($n = 32$). The most common self-injured parts of the body endorsed by the adolescents were hands, arms, fingers and nails ($n = 105$, 62%). Additionally, female adolescents did significantly differ in frequency of NSSI, $\chi_{(1)} = 14.403$, $p < .001$, showing that females were more likely to endorse NSSI ($n = 111$, 27.3%) than males ($n = 59$, 16%).

Daily Peer Hassles, Avoidance-focused Emotion Regulation Processes and NSSI

Table 1 presents descriptive statistics of each variable for the full sample and by gender. Results showed that female adolescents have significantly higher levels of daily peer hassles, EA, brooding, depressive symptoms and NSSI than male adolescents. The effect sizes ranged between small and medium effects (cf. Table 1), according with Cohen's guidelines (1988).

Table 2 shows the Pearson product-moment correlation coefficients for all variables in study for male and females adolescents. As can be seen in Table 2, daily peer hassles is significantly associated with brooding, EA, dissociation, depressive symptoms and NSSI for both males and females. Brooding was significantly and moderately correlated with EA for both males and females. EA and dissociation were significantly correlated with each other and with depressive symptoms and NSSI.

How Daily Peer Hassles Affect Avoidance-focused Emotion Regulation Processes and Depressive Symptoms and NSSI

A path analysis was performed to test a sequential mediation model. The theoretical model was tested through a saturated or just-identified model, which comprised 26 parameters. Since this is a saturated model, its degrees of freedom are zero and the goodness-of-fit is perfect to the data. The following paths were not statistically significant: the direct effect of brooding on NSSI ($b = -.012$, $SE = .056$, $Z = -0.217$, $p = .828$, $\beta = -.01$); and the direct effect of EA on NSSI ($b = .010$, $SE = .016$, $Z = 0.660$, $p = .509$, $\beta = .03$). These non-significant paths were sequentially removed and the model was recalculated (with 24 parameters). The respecified model showed an excellent fit to the data, $GFI = 1.000$, $TLI = 1.000$, $CFI = 1.000$, $RMSEA = .000$, 95% CI [.000, .045], $p = .965$, and all paths were statistically significant. The model explained 15% of brooding, 16% of EA, 13% of dissociation, 42% of depressive symptoms and 28% of NSSI (Figure 1).

Results showed that daily peer hassles had an indirect effect on NSSI, $b = .21$, 95% CI [.164, .264], $p = .001$, through brooding, EA, dissociation and depressive symptoms. Daily peer hassles also had a direct effect on NSSI ($\beta = .12$). There is also an indirect effect of daily peer hassles on depressive symptoms, $b = .26$, 95% CI [.215, .299], $p = .001$, through brooding, EA and dissociation. Daily peer hassles also had a direct effect on depressive symptoms ($\beta = .16$). Regarding the association between avoidance processes and NSSI, results indicate that brooding component of rumination had an indirect effect on NSSI, $b = .08$, 95% CI [.053, .123], $p = .001$, through depressive symptoms. Similarly, there was a significant indirect effect of EA on NSSI, $b = .08$, 95% CI [.047, .123], $p = .001$, through depressive symptoms. Dissociative experiences had a significant indirect effect on NSSI, $b = .07$, 95% CI [.039, .100], $p = .001$, through depressive symptoms. Additionally, dissociative experiences had a direct effect on NSSI ($\beta = .19$).

Gender Differences in the Relationships among Daily Peer Hassles, Brooding, EA, Dissociation, Depressive Symptoms and NSSI

The hypothesized model was tested by a multi-group approach to analyze gender differences in the relationships among daily peer hassles, brooding, EA, dissociation, depressive symptoms and NSSI. Results from the Chi-square difference test showed that the model was not invariant for both genders, $\chi^2_{diff(12)} = 26.321$, $p = .010$. For male adolescents, the model accounted for 20% of brooding, 17% of EA, 14% of dissociation, 43% of depressive symptoms and 26% of NSSI. For female adolescents, the model explained 10% of brooding, 13% of EA, 12% of dissociation, 39% of depressive symptoms, and 28% of NSSI. Results from critical ratios for differences among parameters indicated significant differences on three parameters. First, daily peer hassles was more strongly related to brooding for male adolescents than for female adolescents (z -score = -2.855, $p < .01$, $\beta = .45$ versus $\beta = .31$, respectively). Second, the direct effect of daily peer hassles on EA was stronger for male adolescents than for female adolescents (z -score = -1.996, $p < .05$, $\beta = .41$ versus $\beta = .36$, respectively). Third, depressive symptoms were more strongly associated to NSSI for female adolescents than male adolescents (z -score = 3.485, $p < .01$, $\beta = .41$ versus $\beta = .18$, respectively).

Discussion

The purpose of the present study was to examine whether rumination, EA, dissociation and depressive symptoms mediate the tendency to engage in NSSI in response to daily peer hassles among a

community sample of adolescents. Additionally, this study explored differences between male and female adolescents in daily peer hassles, avoidance-based emotion regulation strategies (i.e., rumination, EA and dissociation), depressive symptoms and NSSI, and tested whether the proposed model was invariant across genders.

The results of this study fit with previous findings showing that the prevalence rate of NSSI among community samples of adolescents is high and female adolescents are at a higher risk than male adolescents to engage in NSSI (e.g., Bresin, & Schoenleber, 2015). Moreover, there are important gender differences in how each gender perceives and responds to stressful daily experiences. Our findings reveal that female adolescents tend to perceive greater daily peer hassles than male adolescents. Additionally, rumination in its maladaptive component (i.e., brooding), experiential avoidance, dissociation and depressive symptoms are higher among female adolescents than male adolescents. Overall, these results are in line with previous research that shows the same pattern (e.g., Biglan et al., 2015; Greco et al., 2008; Howe-Martin et al., 2012; Nolen-Hoeksema, 2001).

Findings in the present study converge with a substantial body of research, showing that daily peer hassles is a risk factor for depressive symptoms and NSSI (e.g., Liu et al., 2014; Xavier et al., 2016a). However, our results extend this prior work by showing the indirect effect of daily peer hassles on NSSI through avoidance-focused emotion regulation strategies and depressive symptoms. More specifically, adolescents who engage in brooding, EA and dissociation in response to daily peer hassles, tend to experience increased levels of depressive symptoms, which in turn impact on NSSI. Overall, these data suggest that, when confronted with daily stressful peer experiences, adolescents who are unable to deploy adaptive strategies to regulate negative emotional states and struggle with maladaptive cognitive and emotion strategies (e.g., rumination, experiential avoidance and dissociation) may experience depressive symptoms and engage in NSSI.

Moreover, the impact of brooding, EA and dissociation on NSSI occurred through increased levels of depressive symptoms. Additionally, dissociative experiences also had a direct effect on NSSI. These results are in accordance with the experiential avoidance model for NSSI proposed by Chapman et al. (2006), clarifying that NSSI is a behavior output that aims at regulating, escaping and generally avoiding thoughts, emotions, memories, sensations or other undesirable internal experiences, which in turn reduces or eliminates the emotional arousal. However, the association between emotional arousal and NSSI establish a vicious cycle through negative reinforcement that maintains NSSI over time (Chapman

et al., 2006). Additionally, NSSI has been found to serve an antidissociation function. In other words, it seems that individuals may use self-injury to interrupt dissociative experiences and numbness (Chapman et al., 2006; Klonsky, 2007; Rallis et al., 2012).

Furthermore, the current study is of key importance in understanding gender differences in the associations between daily peer hassles, rumination, EA, dissociation, depressive symptoms and NSSI. Indeed, results indicate that the relationship between daily peer hassles and brooding and EA is stronger in males than in females. When confronted with daily peer hassles, male adolescents display a high tendency to engage in brooding and to avoid internal experiences than female adolescents. On the other hand, the relationship between depressive symptoms and NSSI is stronger for females in comparison to males. It seems that female adolescents are more likely to respond to stress with internalizing emotions (e.g., depressive symptoms) and subsequently to engage in NSSI.

On the whole, these results are in line with existent theoretical frameworks on gender differences in depression in which women are suggested to be more vulnerable than men to develop depressive symptoms and other psychological disorders, even when confronted with similar stressors (e.g., Nolen-Hoeksema, 2001, 2012). The findings of the current study add to the current knowledge by showing gender differences in daily hassles, emotion regulation processes, depressive symptoms and NSSI in adolescence. While adolescent males are more likely to engage in brooding and EA in response to external distress (i.e., daily peer hassles), adolescent females are more likely to engage in NSSI in response to internal distress (i.e., depressive symptoms).

Limitations

Some limitations of the current study should be noted. Firstly, this study used a cross-sectional design, which implies that causal inferences cannot be drawn. Longitudinal research is needed to identify temporal relationships among variables that are associated with NSSI. Secondly, the study relied on self-report questionnaires and this methodology may lead to bias reporting (e.g., due to social desirability). Future studies should include other assessment methods to assess NSSI and life stressors, such as semi-structures interviews and ecological momentary assessment (EMA). Third, some self-report questionnaires using only a few items (e.g., daily peer hassles) may be limited to capture the variable under study, although the internal consistency was adequate. Fourth, future studies should evaluate the constructs of interest in the same temporal intervals (e.g., lifetime or in the last month). Finally, future studies should examine other types of daily hassles and its impact on adolescents' lives. The model tested

in the present study was intentionally restrained to analyze daily peer hassles since peer group plays an important role on adolescence and this variable has been found to be associated with NSSI (e.g., Xavier et al., 2016a).

Nonetheless, the current study highlights the mediating role of avoidance-based emotion regulation processes and depressive symptoms in the relationship between daily peer hassles and NSSI, as well as gender differences in these associations among adolescents. Thus, this study may have important implications for prevention and intervention efforts. Preventive work should prioritize programs that teach adaptive emotion regulation skills to all adolescents not just to those at risk of psychopathology. Such programs should address mindfulness, psychological flexibility and acceptance of internal experiences and of difficult life circumstances. Indeed, mindfulness-based approaches among children and adolescents have been recently integrated in school curriculum and these approaches have been well-suited in reducing distress and promoting psychological health and well-being (e.g., Burke, 2010). In clinical practice, therapists should help adolescents in becoming less ruminative, avoidant and more psychological flexible by teaching them mindfulness skills as a way of coping with stressful experiences and internal distress. Additionally, gender-specific pathways from daily hassles towards maladaptive emotion regulation strategies, depressive symptoms and NSSI require clinical attention. Continued development of acceptance and mindfulness-based interventions (such as Acceptance and Commitment Therapy - ACT; Dialectical Behavior Therapy - DBT) specifically designed for adolescents are appropriate to promote their psychological health and well-being (e.g., Hayes, & Ciarrochi, 2015).

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Compliance with ethical standards

Conflict of Interest: The authors declare that they have no conflict of interest.

Ethical approval: All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. This article does not contain any studies with animals performed by any of the authors.

Informed consent: Informed consent was obtained from all individual participants included in the study.

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Table 1

Minimum (Min.) and maximum (Max.), Means (M), Standard deviations (SD), independent-samples *t*-test for gender differences in all variables in study and Cohen's *d* effect size ($N = 776$)

Variables	Min	Max	Total sample ($N = 776$)		Males ($n = 369$)		Females ($n = 407$)		<i>t</i> (<i>df</i>)	Cohen's <i>d</i>	<i>r</i>
			<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			
Daily peer hassles (DHMS)	1	4	1.38	0.53	1.29	0.49	1.46	0.51	4.404 (766.824)** *	-0.33	0.16
Brooding (RRS)	1	4	2.49	0.72	2.31	0.61	2.65	0.71	6.666 (774)***	-0.48	0.24
EA (AFQY)	0	4	1.99	0.78	1.79	0.76	2.17	0.76	6.973 (774)***	-0.50	0.24
Dissociation (A-DES-II)	0	10	2.17	1.63	2.09	1.63	2.24	1.64	1.319 (774)	n/a	n/a
Depressive symptoms (DASS-21)	0	3	0.69	0.72	0.57	0.64	0.80	0.76	4.728 (770.135)** *	-0.33	0.16
NSSI (RTSHIA)	0	3	0.19	0.31	0.14	0.25	0.24	0.35	4.547 (729.361)** *	-0.33	0.16

Note. * $p \leq .05$, ** $p \leq .01$, *** $p \leq .001$. n/a = not applicable. DHMS = Daily Hassles Microsystem Scale; RRS= Ruminative Responses Scale; EA = Experiential avoidance measured by the Avoidance and Fusion Questionnaire for Youth (AFQ-Y); A-DES-II = Adolescent Dissociative Experiences Scale-II; DASS-21 = Depression Anxiety and Stress Scales; NSSI = Non-suicidal self-injury measured by the Risk-taking and Self-harm Inventory for Adolescents (RTSHIA).

Table 2

Intercorrelations between all variables for male (above the diagonal; n = 369) and female (below the diagonal; n = 407) adolescents (N = 776)

Variables	Daily Peer Hassles	Brooding	EA	Dissociation	Depression	NSSI
Daily Peer Hassles	-	.45	.41	.38	.43	.37
Brooding	.31	-	.69	.51	.57	.38
EA	.36	.62	-	.55	.55	.39
Dissociation	.35	.39	.52	-	.52	.42
Depressive symptoms	.38	.50	.54	.45	-	.43
NSSI	.29	.24	.29	.38	.49	-

Note. All coefficients are significant at $p < .001$. EA = Experiential Avoidance measured by the Avoidance and Fusion Questionnaire for Youth (AFQY); NSSI = Nonsuicidal self-injury measured by the Risk-taking and Self-harm Inventory for Adolescents (RTSHIA).

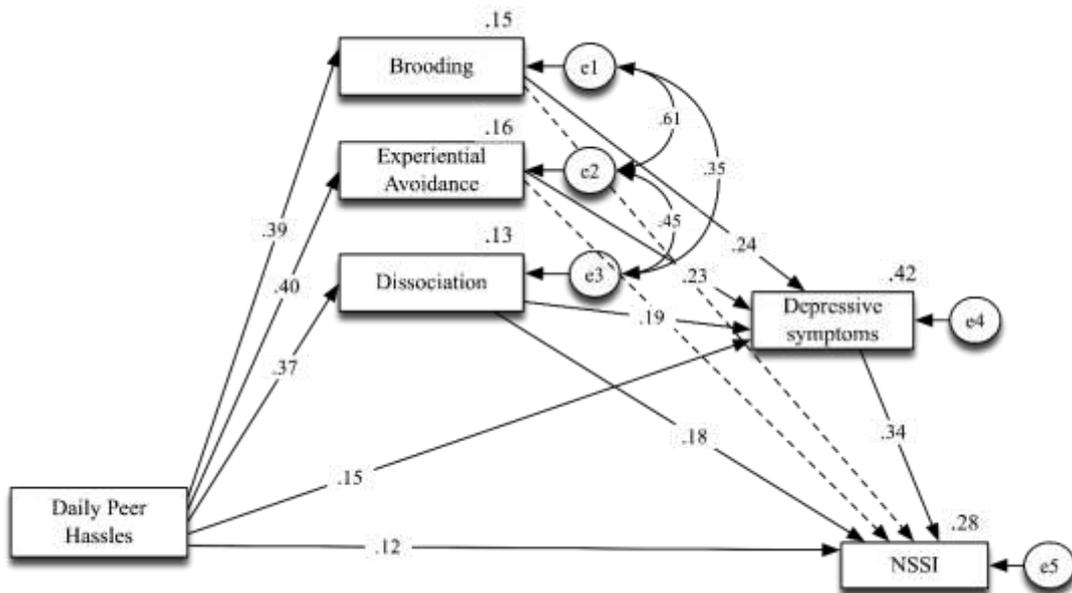


Figure 1. Path diagram for the final model showing the associations between daily peer hassles, brooding, experiential avoidance, dissociation, depressive symptoms and non-suicidal self-injury (NSSI).

Standardized regression coefficients and multiple correlations coefficients are presented; all paths are statistically significant ($p < .001$), except for the two paths drawn in dotted lines.