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Cognitive emotion regulation strategies among emerging adults with different self-harm histories

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Abstract

Background: Self-injurious behaviors have a high prevalence in emerging adulthood. People who engage in self-injury report more emotion regulation difficulties than their peers without self-injury. However, there is little research on how use of emotion regulation strategies varies over brief periods among emerging adults with differing self-harm histories. The current study examined variability in cognitive emotion regulation strategies between emerging adults with no self-harm, previous suicide attempts, or non-suicidal self-injury (NSSI).

Methods: Forty-one racially and ethnically diverse participants, ages 18–27, completed measures of cognitive emotion regulation once daily for one week.

Results: Data collected from 5 of these days were analyzed due to missing data on days 6 and 7. Growth curve analyses revealed differences in trajectories of rumination, acceptance, and catastrophizing, depending on self-harm histories. Specifically, participants with previous NSSI displayed increases in rumination, acceptance, and catastrophizing over time, compared to peers with a previous suicide attempt.

Limitations: The study design was limited by lack of assessment of self-harm during the daily diary, a limited assessment period of only one week, and distal time period of group classification.

Conclusions: These findings suggest that while emerging adults with NSSI histories use more emotion regulation strategies, they may need assistance in selecting when and how to use specific strategies.

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Authors' contributions

EM: Wrote the manuscript draft. **BRW:** Analyzed the data and wrote the manuscript draft. **IY:** Wrote the manuscript draft. **RM:** Oversaw study design, supervised analyses, and reviewed and edited the manuscript.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.jadr.2023.100638.

Keywords

Emotion regulation; Self-harm; Suicide-attempt; Non-suicidal self-injury

1. Introduction

Dysfunctions in emotion regulation are associated with self-injurious behaviors (Selby et al., 2016; Yeo et al., 2020), and self-injurious behaviors remain a prevalent cause of emergency department visits among emerging and young adults (Cairns et al., 2018). Broadly, self-injurious behaviors involve intentionally harming one's body, either with intent to die (i.e., suicide attempts) or without intent to die (i.e., non-suicidal self-injury; NSSI) (Simeon and Favazza, 2001). A better understanding of self-harm among emerging adults can help mitigate the behavior before it persists throughout adulthood and/or becomes life threatening (Bailey et al., 2017). Difficulties in emotion regulation have been found to be associated with self-injurious behaviors – both NSSI and suicide attempts – in cross-sectional research that includes studies with emerging and young adults (Andover and Morris, 2014; Colmnero-Navarette et al., 2022; Kranzler et al., 2016). Furthermore, prospective research with adolescents has found a bidirectional relationship between emotion regulation and NSSI over time, with self-reported ability to regulate emotions predicting lower risk of NSSI, and with NSSI associated with lower self-reported ability to regulate emotions (Robinson et al., 2019). However, this research examined emotion regulation, generally, and did not focus on specific emotion regulation strategies.

There is limited information on the types of thinking that people who are vulnerable to self-injurious behaviors use daily to regulate their emotions, given their history of self-harm. The current study examined variability in cognitive emotion regulation strategies among emerging adults with a history of suicide attempts (SA), NSSI, and no self-harm, over a brief period of time. Identifying how high-risk emerging adults cope with emotional distress can enable clinicians and researchers to design targeted cognitive interventions that meet the needs of this vulnerable group.

1.1. Cognitive emotion regulation and self-injurious behavior

Cognitive emotion regulation refers to ways of thinking people use to alter and manage their emotions in response to specific events (Aldao and Nolen-Hoeksema, 2010; McRae and Gross, 2020). Some cognitive emotion regulation strategies, such as reappraisal (defined below), protect against psychopathology. Others, such as rumination (also defined below) are associated with the onset and maintenance of psychopathology (Aldao and Nolen-Hoeksema, 2010). Individuals with NSSI and SA histories vary in their use of emotion regulation strategies. For instance, a study of college undergraduates with a history of past-year NSSI found three emotion regulation profiles: individuals with average difficulty, low difficulty, and high difficulty regulating their emotions. Individuals with a profile reflecting high emotion regulation difficulty tended to report the highest difficulty regulating negative emotions, high rumination, and high difficulty regulating positive emotions (Guérin-Marion et al., 2021). However, such research tends to be cross-sectional and does not examine

daily variability in emotion regulation nor compare this variability across differing self-harm groups.

Acceptance and positive reappraisal are considered helpful emotion regulation strategies. Acceptance requires the individual to face emotions, thoughts, and surrounding life events with an open and welcoming attitude and outlook (Williams and Lynn, 2010). The goal of acceptance is to experience emotions without trying to change or control them, particularly difficult and distressing emotions (Kohl et al., 2012). Positive reappraisal involves an active process of changing one's thoughts about an event to reduce its negative emotional impact, such that when a negative event occurs, an individual also recognizes the positive aspects of the event, and as such, reinterprets it (Folkman and Moskowitz, 2000). Previous research has shown that positive reappraisal is helpful in assuaging negative emotional experiences and may therefore help combat the urge to engage in NSSI or make suicide attempts (In et al., 2021; Vasudeva and Singh, 2017). Furthermore, a greater tendency to use acceptance has been found to be associated with lower thwarted belongingness, perceived burdensomeness, and suicide ideation, which are all associated with suicide attempts (Baer et al., 2022). Similarly, preliminary results of an acceptance-based emotion regulation group intervention for NSSI found that it reduced NSSI and emotion dysregulation (Gratz and Gunderson, 2006). However, there is little information on how and if these strategies are naturalistically employed by those who have histories of self-harm.

In contrast, some emotion regulation strategies can negatively impact psychological health by maintaining or exacerbating negative thoughts (Kassel et al., 2007). The emotional cascades model (Selby et al., 2016) suggests that rumination, which involves "repetitive, prolonged, and recurrent negative thinking about one's self, feelings, personal concerns, and upsetting experiences" (Watkins and Roberts, 2020, p. 1; see also Nolen-Hoeksema, 1991), intensifies negative emotions and causes individuals to engage in NSSI to escape these intense emotions, thereby creating a cycle of emotion dysregulation. Rumination has been found to predict NSSI prospectively (Nicolai et al., 2016) and is associated with a lifetime history of suicide attempts (Grassia and Gibb, 2009; Polanco-Roman et al., 2015). Whereas past studies have focused on predicting NSSI and history of SAs based on the use of emotion regulation strategies, our goal was to expand upon previous work by examining how individuals with NSSI and SA histories engage in emotion regulation.

Finally, catastrophizing is a cognitive emotion regulation strategy that involves thinking of worst-case scenarios and jumping to the worst possible conclusions in response to a negative event (Garnefski et al., 2001). Catastrophizing is linked to internalizing symptoms and externalizing behaviors such as NSSI (Gysin-Maillart et al., 2020). This occurs across diagnoses, making it important to focus on self-harm transdiagnostically. Most of the current research on catastrophizing in relation to NSSI and SAs has examined the role of pain catastrophizing in patients with chronic illness and pain (Rathod et al., 2016; Enea et al., 2017). The present study adds to the small but growing research on the use of catastrophizing as a cognitive emotion regulation strategy in relation to self-injurious behavior.

1.2. The present study

Studies noting a relationship between emotion (dys)regulation and self-injurious behaviors have primarily relied on predicting the occurrence of SAs or NSSI. Less information is known about the daily use of emotion regulation strategies in response to specific negative events and how these trajectories vary depending on an individual's self-harm history. Previous research has not compared the daily use of helpful vs. harmful emotion regulation strategies among individuals with differing self-harm histories. Delineating NSSI from SA on these variables can inform points of monitoring in treatment that may provide insight into risk for suicide among individuals who engage in self-injury (Claes et al., 2010). The present study addressed this gap through a daily diary study design involving assessment over a brief period of time (one week).

Given that individuals without NSSI and SA tend to exhibit less psychopathology and use coping strategies that are considered more effective, compared to individuals with a history of self-injury (Claes et al., 2010), we hypothesized that emerging adults with a SA or NSSI history would report greater use of rumination and catastrophizing, compared to their peers without self-harm, who would report greater use of positive reappraisal and acceptance over time. Furthermore, we hypothesized that emerging adults with a SA history would show emotion regulation trajectories involving greater use of rumination and catastrophizing, compared to their peers with NSSI (but without SA histories), based on research suggesting that individuals with SA histories use less effective coping skills and have more aversive reaction patterns to stressful events, compared to individuals of other self-harm backgrounds without SA (Claes et al., 2010).

2. Methods

2.1. Participants

Participants included 41 emerging adults (17% male and 83% female), ages 18 to 27 years (M = 19.3, SD = 2.0). Participants were recruited after completing the 18-month follow-up portion of a longitudinal study, based on whether they reported a history of NSSI (n = 12), SAs (with or without NSSI; n = 13), or no history of self-harm (n = 16) during the baseline portion of the ongoing study. The racial/ethnic composition of the sample was as follows: 34% (n = 14) identified as Asian, 32% (n = 13) as White, 15% (n = 6) as Biracial/Multiracial (4 Hispanic/Latine, 1 Black and Native American, 1 Black and White), 12% (n = 5) as Black, and 7% (n = 3) as Hispanic/Latine. Sixteen participants (39%) were born outside of the United States, and thirty-two (78%) participants reported that both of their parents were born outside of the United States. Participants identified primarily as heterosexual (90%; n = 37), two identified as bisexual (5%), and two preferred not to report (5%).

2.2. Procedures

Participants were recruited from a larger study focused on cognitive predictors of suicide ideation among young adults (see Miranda et al., 2023). In the larger study, participants were recruited primarily from a public commuter college in New York City, along with other colleges in the New York City metropolitan area, pre-screened for history of suicide ideation or SA, and a subsample completed a measure that assessed for NSSI and also SAs (see

Polanco-Roman et al., 2015, for details). Individuals were recruited in 2013–2014 for the present study based on whether they reported a history of one or more of the following: a previous SA, NSSI, or no previous history of self-injurious thoughts and behaviors (no suicide ideation, SA, or NSSI). Participants willing to participate from this subsample resulted in a sample size of 41 for the current study. These individuals provided informed consent to take part in the study, received a link to the online study daily for seven days, and were given monetary compensation up to $25 in the form of an Amazon gift card, depending on how many days they participated in the study. The diary was to be filled out online every evening (after 6pm and before 8am the next morning) via Qualtrics. Procedures were approved by the Institutional Review Board of the City University of New York.

2.3. Measures

Self-Harm Group Classification.—Participants completed the Self-Harm Behavior Questionnaire (SBHQ; Gutierrez et al., 2001), a self-report questionnaire that assesses self-harm behaviors, including suicide attempts, age of onset, frequency, and last time an individual engaged in self-harm. Based on responses to previous experiences with self-harm and intent to die, participants were classified as having NSSI only ($n = 12$), suicide attempts only ($n = 4$), both ($n = 9$), or neither ($n = 16$) (see Polanco-Roman et al., 2015). Given that there were only 4 participants with suicide attempts without NSSI, these participants were combined with the group that included individuals with a history of both suicide attempts and NSSI. Participants who reported NSSI histories (including those in the suicide attempt group) reported engaging in NSSI either by cutting, scratching, carving, picking at open wounds, biting themselves, or digging their nails into their skin, with one participant reporting both cutting and banging their head against a wall. Among participants who reported a suicide attempt history, nine participants reported a suicide attempt by ingestion of pills (with one of these participants also reporting that they attempted to hang themselves), three participants reported an attempt to drown themselves (with one of these participants also reporting cutting themselves and another also reporting attempting to jump off of a small building and onto train tracks), and one participant attempted suicide by turning on the gas for 2–3 h. Furthermore, as part of the original longitudinal study from which individuals were recruited, they completed the Suicidal Behavior Screening (see Miranda et al., 2023) every 6 months during the 18 months they were in the study. This measure included questions about lifetime suicide attempt history, about whether participants had made a suicide attempt in the previous year, and about the last time they had made a suicide attempt. Participants completed this measure at the study's 18-month follow up, in close proximity to when they were recruited for the present study, and no participants reported a suicide attempt in the year before they were enrolled in the present study. Comparable information about whether participants engaged in NSSI during this time was not collected.[1]

[1]Based on their age reported during the baseline assessment of the longitudinal study from which participants were recruited and the age at which they reported their last NSSI and suicide attempt on the SHBQ (completed during a second baseline assessment), we computed time since participants' most recent NSSI and suicide attempt. At that time, individuals in the NSSI group reported an average of 2.5 years (SD = 1.9; range 0–6) since their last instance of NSSI (with one participant missing data on recency of last NSSI). Among individuals in the suicide attempt group, average years since their last suicide attempt was 4.6 years (SD = 3.8; range 0–12), and average years since their last NSSI was 3.9 (SD = 3.4; range 1–12). Participants were not asked about NSSI after completion of the SBHQ, and thus, we had no information about NSSI in the 18 months prior to participation in the current study.

Cognitive Emotion Regulation Questionnaire-short **(CERQ-short; Garnefski and Kraaij, 2006).—**The 18-item CERQ-short contains 9 subscales assessing cognitive emotion regulation strategies people use during or after the experience of threatening or stressful life events. In the present study, participants were asked about the cognitive emotion regulation strategies they used related to a negative event they experienced that day (i.e., "Please think back to the single most emotionally provoking negative event that happened to you today…"), such that items were reworded to be in the past tense. Participants rated each of the items from 1 (very slightly or not at all) to 5 (extremely). We selected rumination, catastrophizing, acceptance, and positive reappraisal as a focus of the present study due to their implications for NSSI as adaptive and nonadaptive ways of regulating emotions. The associated subscales of the CERQ-short were used: rumination (i.e., *I thought about how I felt about what I had experienced; I was preoccupied with what I thought and felt about what I had experienced*), catastrophizing (i.e., *I kept thinking about how terrible it was what I had experienced; I continually thought how horrible the situation had been*), acceptance (i.e., *I thought that I had to accept the situation; I thought that I had to accept that this had happened*), and positive reappraisal (i.e., *I thought that I could become a stronger person as a result of what had happened; I thought that I could learn something from the situation*).

2.4. Data analysis

Given missing data on days 6 (15%) and 7 (17%), data were analyzed for the first five days of the online survey only, which only had 2.5% missing data. We conducted growth curve modeling analyses using the Linear and Nonlinear Mixed Effects Models (nlme) package in Rstudio Team (2022). To assess model fit, we computed models in a stepwise fashion. The first model was a no-growth model that only included a fixed intercept. Next, a random intercept was added to capture variability at baseline across self-harm groups. Then, a random slope was added to the random intercept model to capture individual changes in the outcome variable. Next, the variance structure was modeled using an autoregressive model to account for variance from one measurement occasion to the next. Fit indices are presented in the supplemental material. In each model, we examined 1) the effect of time, 2) the effect of self-harm group, and 3) the interaction of time and self-harm group on emotion regulation strategies. We used maximum likelihood estimation to account for missing data, and significance level was established at $p < .05$.

3. Results

3.1. Rumination

Analyses with rumination used the random intercept model, because it was comparable to the no-growth model (see supplemental material). Findings revealed that levels of rumination decreased with time. Further, participants with NSSI displayed higher levels of rumination over time compared to peers with no self-harm and peers with lifetime SA (See Table 1 and Fig. 1).

3.2. Acceptance

Analyses with acceptance used the random intercept model to account for nesting of participants over time (see supplemental material). Findings revealed that, on average, participants' levels of acceptance decreased with time. Further, a significant effect of group emerged, indicating that compared to participants with no self-harm, those with a SA displayed higher levels of acceptance at baseline. When the SA group was added as the reference group, participants with NSSI displayed an increase in acceptance over time, in comparison (See Table 1 and Fig. 2).

3.3. Catastrophizing

Analyses with catastrophizing used a random intercept and random slope model (see supplemental material). Findings revealed that when the no self-harm group was added as the reference group, there was no effect of time or group, nor was the interaction of time and group significant. However, when participants with a previous SA were added as the reference group, results indicated a significant interaction between time and group. Individuals with past NSSI displayed increases in catastrophizing over time compared to those with a SA history (See Table 1 and Fig. 3).

3.4. Positive reappraisal

Analyses with positive reappraisal used a random intercept and random slope model (see supplemental material). Subsequent analyses revealed no significant effect of time or group, nor was the interaction between time and group significant, irrespective of the reference group. In other words, participants with different histories of self-harm displayed similar trajectories of positive reappraisal over time (See Table 1 and Fig. 4).[2]

4. Discussion

The present study examined differences in emotion regulation strategies among emerging adults with varying histories of self-harm. Findings indicate variations in use of emotion regulation strategies over one week depending on self-harm history. Specifically, emerging adults with a history of NSSI-only displayed consistently elevated levels of rumination compared to peers with no self-harm and those with SA. Further, individuals with a SA demonstrated initial high levels of acceptance compared to peers, but those with NSSI displayed increases in acceptance over the week, compared to peers with SA. Emerging adults with a history of NSSI showed increases in their use of catastrophizing over the week, compared to peers with a SA history. However, emerging adults, irrespective of their self-harm history, displayed similar trajectories of positive reappraisal over the week. These findings contribute new insights into how emotion regulation strategies are employed daily depending on self-harm history.

The finding that emerging adults with NSSI displayed consistently elevated levels of rumination over one week adds support to the emotional cascades theory (Selby et al.,

[2]We replicated analyses removing participants who reported a suicide attempt history but no NSSI. All findings remained the same except one: When comparing participants with NSSI and SA, those with NSSI only no longer showed significant increases in rumination over the five days. This difference in findings could be due to lower power, given a smaller sample size.

2016), which postulates that NSSI functions partially as a distraction from cascades of rumination, and is consistent with profiles of emotion regulation identified in a cross-sectional study of college students that compared those with and without NSSI histories (Guérin-Marion et al., 2021). Individuals who engage in NSSI may distract themselves from ruminating by inflicting self-harm, thus reinforcing the cycle of high levels of rumination. Meta-analytic research shows that rumination is associated with NSSI history and frequency, and findings suggest that rumination predicts NSSI (Coleman et al., 2022). It is possible that rumination and NSSI share a bidirectional relationship, such that rumination may lead to more episodes of NSSI, and individuals who already engage in NSSI may frequently engage in ruminative thinking, thereby reinforcing this relationship.

Findings indicated that while participants with SA history displayed reductions in catastrophizing over one week, those with a history of NSSI-only displayed an opposite pattern, highlighting differences in this emotion regulation strategy between these two groups. These findings lend support to previous cross-sectional research with adolescents suggesting that catastrophizing may be a vulnerability factor for individuals with NSSI (Weismoore and Esposito-Smythers, 2010). Further, previous work suggests shared variance between rumination and catastrophizing, indicative of repetitive negative thinking of negative content (Coleman et al., 2022). Perhaps individuals with NSSI experience increased negative affect while considering worst-case scenarios, which may contribute to negative emotional cascades that result in NSSI (Selby et al., 2016), reinforcing the cycle of negative affect and NSSI. Previous work has also found catastrophizing to be positively associated with both the presence and severity of suicide ideation among university students (Hasani and Miraghaie, 2012). Although in the present sample, participants in the NSSI-only group displayed increased catastrophizing, relative to those with SA history, catastrophizing may also constitute a vulnerability factor for SAs. For example, individuals who consider worst-case scenarios might experience elevated levels of distress perceived as unbearable, which could facilitate consideration of suicide as an escape (Baumeister, 1990).

On the other hand, participants with NSSI displayed increases in acceptance over the week compared to their peers with SA, inconsistent with our hypothesis. Given the limited research, it is unclear why emerging adults with NSSI reported increasing levels of acceptance compared to peers. Research indicates that acceptance is ineffective at reducing urges to self-injure or negative affect (In et al., 2021). Individuals with NSSI histories may use acceptance to cope with negative affect but may experience difficulty with context-appropriate emotion regulation, leading to the greater variability in their use of strategies. It should also be noted that participants with SA histories maintained relatively high levels of acceptance compared to peers with no self-harm history. Together, these findings might suggest that individuals with self-harm histories intentionally attempt to regulate negative affect by accepting adverse experiences or have difficulty effectively applying these emotion regulation strategies. Alternatively, it is also possible that repeated assessment over the 5 days contributed to participant levels of acceptance through repeated exposure and reporting. The effect of repeated assessment on acceptance as an emotion regulation strategy should be taken into consideration in future research.

A surprising finding was that irrespective of self-harm history, emerging adults displayed similar trajectories of positive reappraisal over one week. All groups reported its use at similar moderate rates, suggesting some level of daily use. Perhaps participants reported engaging in reappraisal but may or may not have implemented this strategy in a helpful way. Further, positive reappraisal is a cognitively challenging strategy that may require intentional practice and is not employed intuitively. Acknowledging the positive impact of a negative event can be challenging for any individual; using positive reappraisal may be especially challenging for individuals who cope with negative emotions by engaging in self-injury. Positive reappraisal may require more cognitive effort than other emotion regulation strategies (Qi et al., 2017).

Several limitations are worth noting. Self-harm and suicidal behavior were not concurrently assessed during the diary study, so it is unclear whether participants potentially relied on NSSI to regulate their affect. The study did not account for context and cross-situational variability, which may affect the use of emotion regulation strategies (Aldao, 2013). For example, the effects of current psychiatric symptoms on emotion regulation strategy selection in daily life were not considered. Additionally, we did not assess the recency of NSSI or SA and focused on lifetime history of self-harm. Thus, the study design precludes us from tying the emotion regulation strategies directly to the self-harm behavior. In addition, rumination was assessed, generally, but research suggests that different subtypes of rumination may be associated with different forms of self-harm. For instance, cross-sectional analyses involving the larger study from which the present sample was recruited found that rumination involving the tendency to dwell on one's dysphoric mood was associated with having a history of a suicide attempt, while rumination involving attempts to understand the reasons for one's dysphoric mood was associated with having a history of NSSI, or with having a history of both NSSI and a suicide attempt (Polanco-Roman et al., 2015). Future research should examine the use of different ruminative subtypes over time by individuals with differing histories of self-injury. Furthermore, the present study also includes a small sample of participants and provides a snapshot of five days from their lives, which may not be fully representative of their daily use of emotion regulation. Results are thus preliminary and should be interpreted with these limitations in mind.

Nevertheless, the present study contributes to the growing body of work on the relation between self-injury and emotion regulation. Given the variability of strategies used by emerging adults with a history of SA, future research should examine whether having such individuals strategically use specific emotion regulation strategies, depending on the context, could help prevent them from becoming dysregulated in their use of strategies by ensuring use of situationally appropriate ones. Future research should also examine emotion regulation use among these individuals over longer time periods, with larger samples, while concurrently assessing for self-harm as a possible confounding emotion regulation strategy. Individuals with NSSI histories appear to use both adaptive and non-adaptive emotion regulation strategies. Interventions may focus on psychoeducation about which strategies can best be employed under given circumstances.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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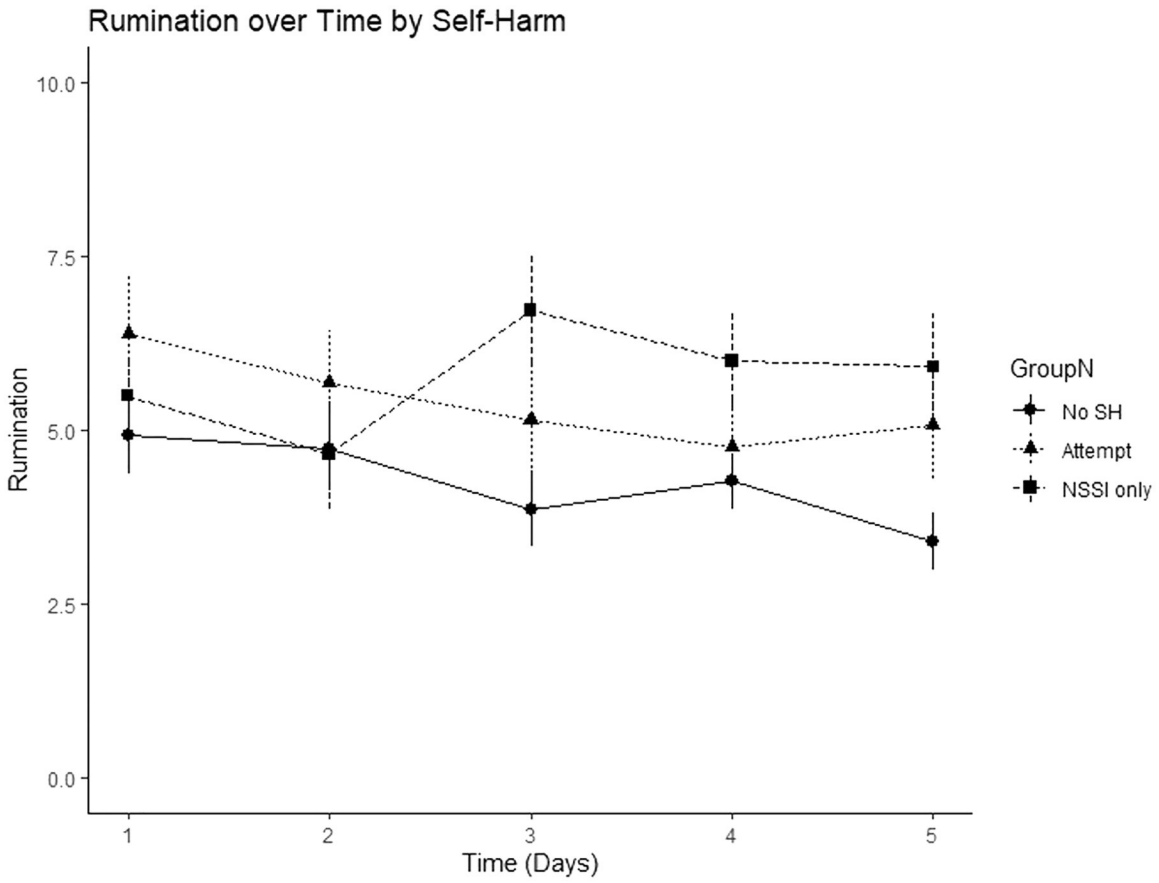

Fig. 1.

Individuals with NSSI-only history had increased self-reported rumination over time compared to individuals with no self-harm history and also compared to individuals with SA history.

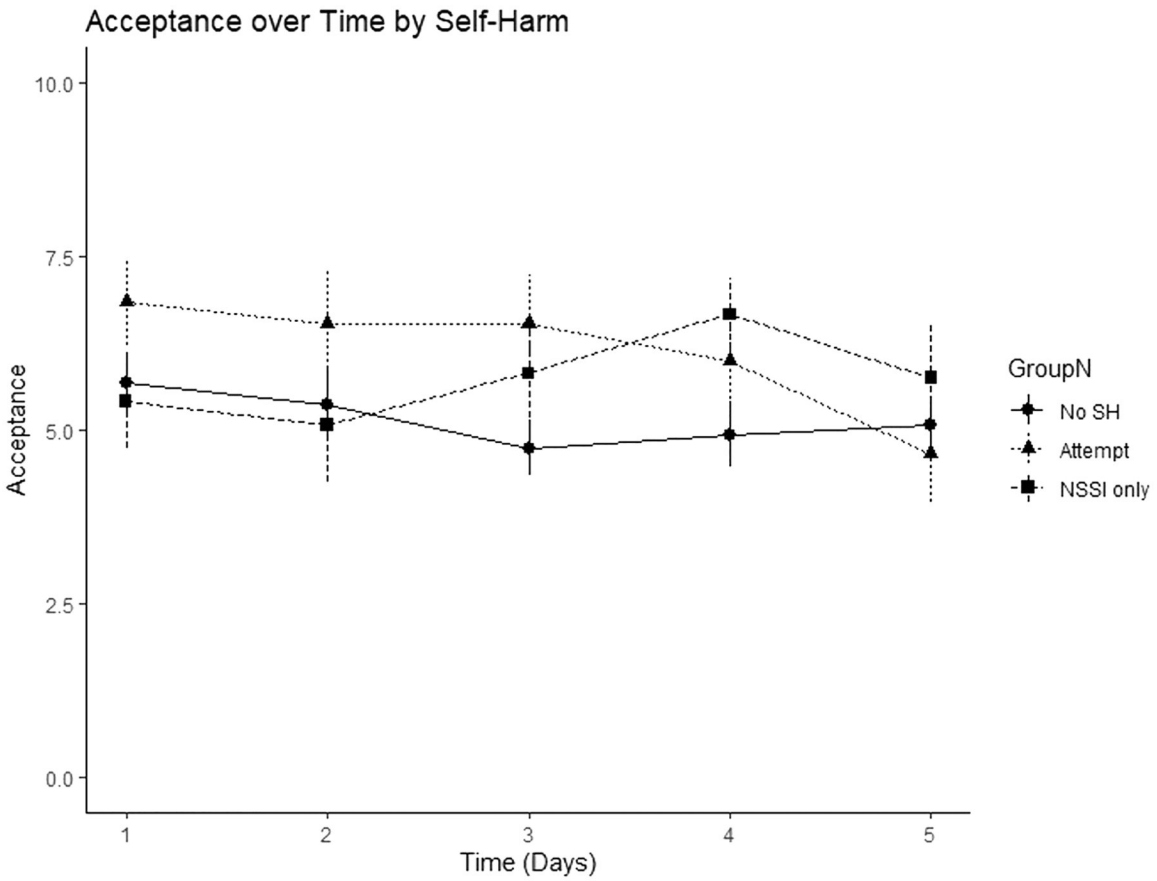

Fig. 2.

Individuals with NSSI-only history had increased self-reported acceptance over time, compared to individuals with SA history.

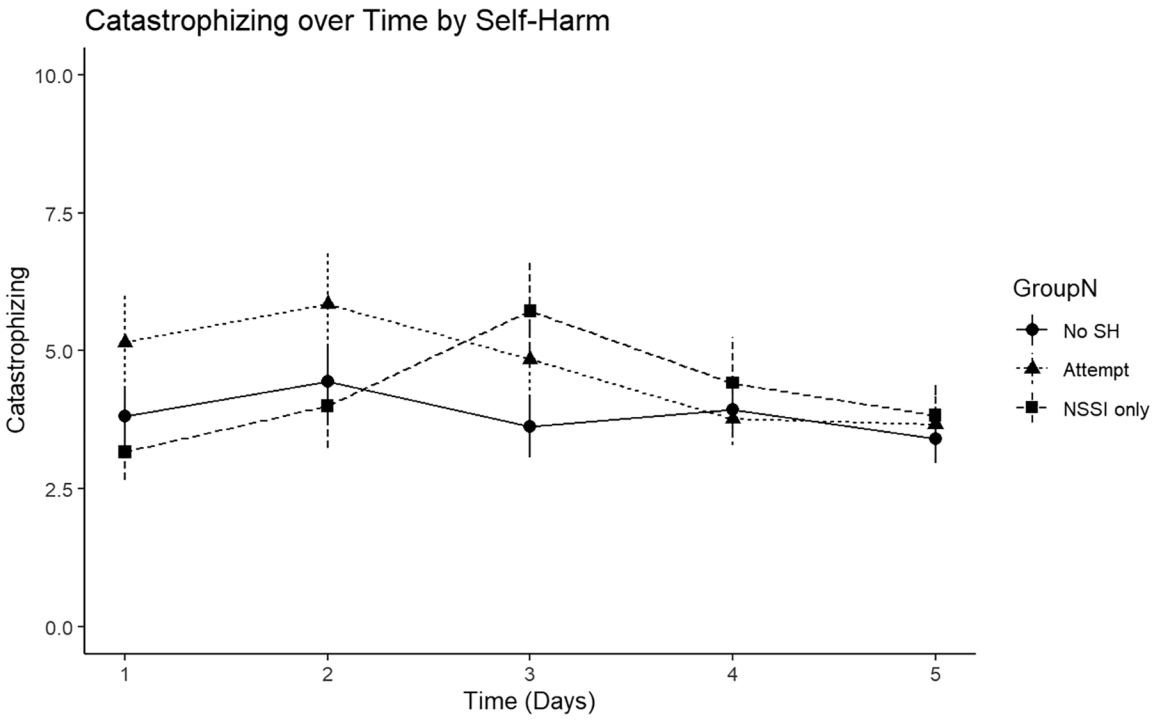

Fig. 3.

Individuals with NSSI-only history had increased self-reported catastrophizing over time, compared to individuals with SA history.

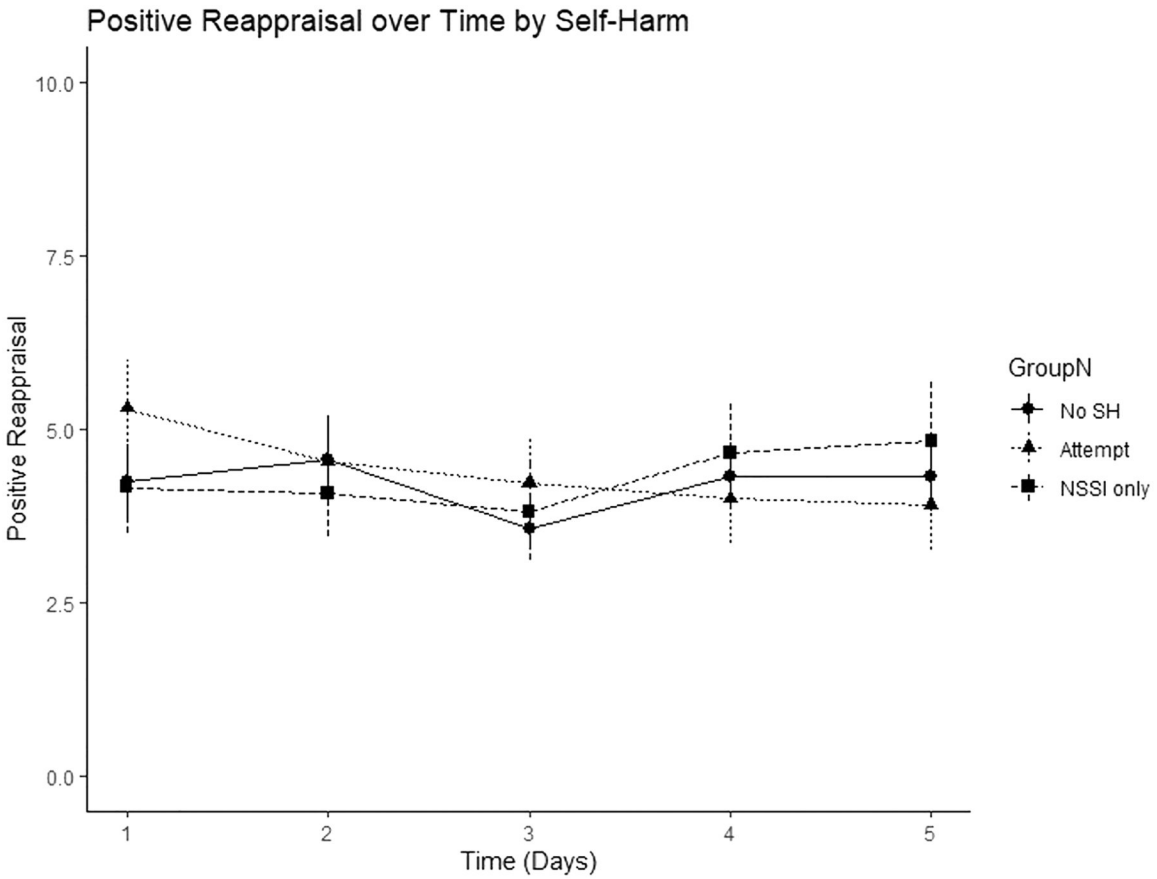

Fig. 4.

There was no significant change in positive reappraisal over time, with all groups showing similar trajectories over five days.

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Table 1

Multilevel model examining effects of self-harm on emotion regulation strategies over time.

	Rumination (No SH)				**Rumination (SA)**			
Fixed effects	***B***	***se***	***t***	**95% CI**	***b***	***se***	***t***	**95% CI**
Time	−0.36 *	0.16	−2.34	−0.67, −0.06	−0.35 *	0.17	−2.04	−0.67, −0.02
No Self-Harm	–	–	–	–	−1.16	0.78	−1.50	−2.71, 0.39
Suicide attempt	1.16	0.78	1.50	−0.39, 2.71	–	–	–	–
NSSI	0.33	0.79	0.42	−1.25, 1.92	−0.83	0.83	−0.99	−2.48, 0.83
Time*No SH	–	–	–	–	−0.01	0.23	−0.05	−0.46, 0.44
Time*SA	0.01	0.23	0.05	−0.44, 0.46	–	–	–	–
Time*NSSI	0.58 *	0.24	2.47	0.12, 1.04	0.57 *	0.25	2.30	0.09, 1.05
Random Effects								
Intercept	2.01			1.11, 3.64	2.01			1.11, 3.64
Slope	–	–	–	–	–	–	–	–
Level 1 residual	3.61			2.90, 4.49	3.61			2.90, 4.49
	Acceptance (No SH)				**Acceptance (SA)**			
Fixed effects	***b***	***se***	***t***	**95% CI**	***b***	***se***	***t***	**95% CI**
Time	−0.16	0.14	−1.19	−0.43, 0.10	−0.48 **	0.15	−3.18	−0.77, −0.19
No Self-Harm	–	–	–	–	−1.59 *	0.73	−2.19	−3.04, −0.14
Suicide attempt	1.59 *	0.73	2.19	0.14, 3.04	–	–	–	–
NSSI	−0.20	0.74	−0.27	−1.68, 1.28	−1.79 *	0.78	−2.30	−3.34, −0.24
Time*No SH	–	–	–	–	0.32	0.20	1.56	−0.08, 0.71
Time*SA	−0.32	0.20	−1.56	−0.71, 0.08	–	–	–	–
Time*NSSI	0.39	0.21	1.88	−0.01, 0.79	0.71 **	0.22	3.27	0.29, 1.13
Random Effects								
Intercept	2.00			1.15, 3.49	2.00			1.15, 3.49
Slope	–	–	–	–	–	–	–	–
Level 1 residual	2.77			2.23, 3.45	2.77			2.23, 3.45
	Catastrophizing (No SH)				**Catastrophizing (SA)**			
Fixed effects	***b***	***se***	***t***	**95% CI**	***b***	***se***	***t***	**95% CI**

Time	−0.14	0.18	−0.79	−0.49, 0.21	−0.50*	0.20	−2.54	−0.88, −0.12
No Self-Harm	–	–	–	–	−1.55	0.91	−1.71	−3.36, 0.26
Suicide attempt	1.55	0.91	1.71	−0.26, 3.36	–	–	–	–
NSSI	−0.28	0.93	−0.30	−2.13, 1.57	−1.83	0.97	−1.88	−3.77, 0.11
Time*No SH	–	–	–	–	0.36	0.27	1.36	−0.16, 0.88
Time*SA	−0.36	0.27	−1.36	−0.88, 0.16	–	–	–	–
Time*NSSI	0.31	0.27	1.17	−0.21, 0.84	0.67*	0.28	2.39	0.13, 1.22
Random Effects								
Intercept	3.53			1.72, 7.26	3.53			1.72, 7.26
Slope	0.11			0.01, 0.89	0.11			0.01, 0.89
Level 1 residual	3.67			2.85, 4.73	3.67			2.85, 4.73
	Positive Reappraisal (No SH)				**Positive Reappraisal (SA)**			
Fixed effects	***b***	***se***	***t***	**95% CI**	***b***	***se***	***t***	**95% CI**
Time	−0.03	0.18	−0.14	−0.38, 0.32	−0.32	0.20	−1.62	−0.71, 0.06
No Self-Harm	–	–	–	–	−0.82	0.75	−1.10	−2.31, 0.67
Suicide attempt	0.82	0.75	1.10	−0.67, 2.31	–	–	–	–
NSSI	−0.29	0.76	−0.38	−1.82, 1.23	−1.11	0.80	−1.39	−2.71, 0.49
Time*No SH	–	–	–	–	0.30	0.27	1.11	−0.22, 0.82
Time*SA	−0.30	0.27	−1.11	−0.82, 0.22	–	–	–	–
Time*NSSI	0.22	0.27	0.80	−0.31, 0.75	0.51	0.28	1.81	−0.04, 1.07
Random Effects								
Intercept	2.36			1.14, 4.90	2.36			1.14, 4.90
Slope	0.23			0.09, 0.60	0.23			0.09, 0.60
Level 1 residual	2.52			1.95, 3.24	2.52			1.95, 3.24

Note: In the first models, the no self-harm group is the reference group, and in the second models, the suicide attempt group is the reference group.

*$p < .05$.

**$p < .01$.