Youth Neuropsychology Society Research Mentorship Program

ADOLESCENTS NAVIGATING CHRONIC CONDITIONS: HOW AUTOIMMUNE DISORDERS IMPACT EMOTION REGULATION AND LONG-TERM DECISION-MAKING

Mentee: Valentina Bailón Hernández - Email: vale.bailonn@gmail.com

Mentor: Min-Ji Sophie Jin - Email: sophiejin06@gmail.com

ABSTRACT

During adolescence, youth diagnosed with a chronic autoimmune condition encounter unique emotional and cognitive challenges caused by the psychological and physiological burdens of illness management. This study compared and analyzed emotion regulation and decision-making between adolescents with chronic autoimmune conditions and their healthy peers. A comparative, mixed-methods approach was used to study a group of 32 adolescents aged 12 to 18 (16 with autoimmune diagnoses and 16 matched controls), the design consisted of completing standardized measures, including the Emotional Regulation Questionnaire for Children and Adolescents (ERQ-CA), a decision-making scale, the Perceived Stress Scale (PSS), and a digitalized version of the Columbia Card Task (CCT). Participants also responded to a survey of open-ended questions regarding decision-making under stress and uncertainty. Results show that adolescents living with chronic autoimmune conditions have a higher use of expressive suppression and lower cognitive reappraisal within their emotion regulation strategies, compared to their healthy peers. Their patterns on the CCT were also more inconsistent. Finally, the answers to the open-ended questions revealed repeated themes of harsh decision-making while in stressful situations and limited thinking about their long-term plans and goals, compared to their

healthy peers. These findings suggest that chronic autoimmune conditions may have a significant impact on emotional and cognitive regulation in adolescents, highlighting the urgency for support systems in academic and social environments.

KEYWORDS

Chronic autoimmune conditions, adolescence, cognitive regulation, emotion regulation strategies, long-term planning

INTRODUCTION

Adolescence is a critical stage of neural development with different brain sensitivity and responsivity, characterized by emotional complexity and an increasing desire for autonomy and independence. During this period, adolescents develop the abilities to regulate emotions and make complicated decisions under pressure and stress, both are crucial skills for a healthy psychosociological development (Jaworska & MacQueen, 2015). However, for adolescents diagnosed with chronic autoimmune conditions, these challenges are often exacerbated by the added burden of recurring medical stress, mental fatigue, and uncertainty related to their illness. Chronic conditions such as type 1 diabetes, juvenile fibromyalgia, and idiopathic arthritis are critically important health problems involving chronic pain and dysregulation in the immune system. In addition to their physical symptoms, these conditions are also associated with deficits in several areas of daily living, including school, relationships, and emotional functioning (Mano et al., 2020). According to research, autoimmune conditions are also associated with significant health-related anxiety, fear of stigmatization, and concerns of missed opportunities. These elements all lead to increased emotional distress, poor self-regulation strategies, and an overall negative impact on their neuropsychological functioning (Boris et al., 2024). Adolescents may therefore approach decision-making, particularly when they are under pressure or in emotionally-charged situations, differently due to these challenges.

Emotion regulation, defined as the group of strategies that are used to manage the experience and expression of emotional states (Gross, 2014). Two fundamental techniques to regulate emotions in adolescence are cognitive reappraisal (changing the way someone thinks about potentially emotionally charged situations) and expressive suppression (changing the way someone behaves and responds in emotionally charged situations) (Gross & John, 2003). While cognitive

reappraisal is often associated with healthier patterns of social functioning and well-being, expressive suppression is linked to negative cognitive and social consequences and patterns (Cutuli, 2014). Adolescents diagnosed with chronic autoimmune disorders often rely more on expressive suppression due to physical fatigue, stigma, or a desire to lead a "normal" teenage life; this may, in turn, affect their emotional well-being and cognitive performance negatively. Another skill underdeveloped in adolescence and influenced by emotion regulation is decision-making, especially in the context of long-term planning and risk evaluation. Autoimmune disorders may complicate these decision-making processes by shifting their attention to immediate situations (e.g., symptom flare-ups), altering time perception, and insensitivity to risk caused by a desire to "be alike" (Michaud et al., 2007). Despite the theoretical links, research directly comparing decision-making and emotion regulation patterns between adolescents with chronic autoimmune conditions and their healthy peers remains incredibly limited.

This study's objective is to close this gap and provide an answer to the question: How do adolescents aged 12 to 18 diagnosed with chronic autoimmune disorders differ from their healthy peers in emotional regulation and decision-making related to stress, risk, and long-term planning? By gathering and analyzing self-report and behavioral data from adolescents with and without autoimmune disorders, the study aims to obtain a better understanding of how autoimmune disorders affect emotional and cognitive functioning throughout adolescence

METHODOLOGY

Design

This study employed a comparative, mixed-methods focus, spread throughout a 5-week timeline, to analyze differences in emotional regulation and decision-making under stress between adolescents diagnosed with autoimmune disorders and those without. Quantitative self-report measures, a digitalized behavioral task, and a sequence of qualitative open-ended questions were used to obtain a multifaceted understanding of emotion-regulation and decision-making processes in the context of chronic illness during adolescence.

Participants

The final sample was made up of 32 adolescents, ages between 12 and 18 years, divided into two groups. 16 participants with medically verified diagnosis of chronic autoimmune disease, such as juvenile idiopathic arthritis, systemic lupus erythematosus, and type 1 diabetes, comprised the clinical group. The control group was made up of 16 healthy adolescents without history of autoimmune disorders or psychiatric diagnosis. Both groups were matched on two demographic variables: age and gender.

Inclusion criteria required fluency in English or Spanish, current enrollment in school, and willingness to complete the entire research protocol. Participants were excluded if they were diagnosed with any neurodevelopmental or psychiatric disorder (e.g., ADHD, depression), used medication known to affect mood regulation and cognitive function (e.g., benzodiazepines, stimulants), or at the time of collection, reported acute medical events. Recruitment happened through autoimmune support networks for adolescents and parents, social media outreach, and digital flyers shared in adolescent health and wellness spaces. Interested participants were asked to complete a secure digital screening to verify eligibility. Parental consent and adolescent assent

were obtained prior through participation, and participants were informed of their right to withdraw from the procedure at any time without consequence (see Appendix A). All identifying information remained anonymous, and data were stored securely in protected files accessible only to the researcher.

Measures

The Emotion Regulation Questionnaire for Children and Adolescents (ERQ-CA), a 10-item test designed to collect adolescents' use of two core strategies: cognitive reappraisal and expressive suppression, was used in the protocol to assess emotion regulation (Gullone & Taffe, 2011). Responses were recorded in a 5-point Likert scale, higher scores denoted more frequent usage of the respective strategies.

Stress was measured using the Perceived Stress Scale (PSS). This 10-item survey assesses how frequently one experiences stress-related feelings and thoughts in the past month. (Lee, 2012)

Decision-making patterns were evaluated using a custom 8-item survey (see Appendix B), titled the Adolescent Decision-making Questionnaire. Items measured impulsivity, planning, and emotional reactivity in decision-making, using a 5-point agreement scale.

Participants completed both versions of a digitalized Columbia Card Task (CCT), which is used to measure decision-making in emotionally charged ("hot") and cognitively controlled ("cold") environments, in order to examine real-time decision-making tendencies. Each participant was presented with 32 faced-down cards and informed of how many cards contained losses, the loss amount, and the gain per safe card. Then, they chose how many cards to turn over, balancing risk and reward. The CCT has been validated in adolescent samples (Figner et al., 2009). Performance was measured by the average number of cards selected and variability in risk sensitivity across both versions. The higher number of selected cards in high-loss contexts

indicated elevated risk-taking, whereas risk regulation across versions reflected cognitive-emotional control.

Finally, participants responded to two open-ended prompts (see Appendix C) to gather qualitative data. Participants were tasked with describing a stressful decision-making situation and how they handled their emotions during that time.

Procedure

All data was collected remotely via secure online platforms. All measures were completed through Google Forms, including the ERQ-CA and PSS, while the Columbia Card Task was administered through a digital link to an open-source simulation.

Each session took approximately 30–45 minutes and was conducted in a single setting, though participants were allowed to pause and resume as needed. Instructions were standardized, and a brief tutorial was provided before the CCT. Participants were debriefed after each individual session and given a list of adolescent mental health resources.

Data Analysis

The SPSS (Version XX), with statistical significance set at $p < .05$, was used to analyze quantitative data. Descriptive statistics were calculated for all primary variables. Independent samples t-tests were conducted to compare the groups on emotion regulation, perceived stress, and decision-making outcomes. ANCOVA was performed when controlling for perceived stress as a covariate. Pearson correlations were used to explore associations between emotion regulation strategies and Columbia Card Task performance.

A simplified thematic approach adapted for solo research contexts was used to analyze qualitative responses from open-ended prompts. After reading through all responses multiple times to gain familiarity, repeated ideas or phrases were coded and grouped into emerging

categories. Then, based on trends in the experiences of the participants, such as coping mechanisms or the rationale behind choices, theme labels were applied. While inter-rater reliability was not assessed due to the independent nature of the project, transparency was maintained by keeping an audit trail of all codes, category decisions, and example quotes. The qualitative data added depth and context to the quantitative results, particularly in understanding adolescents' subjective experiences with stress and self-regulation.

RESULTS

Descriptive Statistics and Group Comparisons

A total of 32 participants completed all components of the study, including 16 adolescents with chronic autoimmune conditions and 16 healthy controls. Descriptive statistics for each measure are presented in Table 1. Perceived stress levels were considerably greater among adolescents with chronic illnesses on average than among their healthy peers, suggesting a moderate-to-large effect size.

For emotion regulation, participants with chronic illness scored significantly higher on expressive suppression than healthy controls. In contrast, scores on cognitive reappraisal did not significantly differ between groups ($p > .05$).

On the adolescent decision-making questionnaire, the chronically ill group reported more frequent impulsivity and emotional interference in decision-making, with lower mean scores on planning-based items than controls.

TABLE 1. Descriptive Statistics and Independent Samples t-tests Comparing Chronically Ill and Healthy Adolescents

Measure	Chronically Ill (n = 16)	Healthy Controls (n = 16)	*t*(28)	*p*	Cohen's *d*
Perceived Stress (PSS-A)	25.7 (5.3)	19.8 (4.6)	3.34	**.002**	1.22
Expressive Suppression (ERQ-CA)	3.9 (0.6)	3.2 (0.5)	3.48	**.002**	1.30
Cognitive Reappraisal (ERQ-CA)	3.4 (0.7)	3.6 (0.6)	–0.79	.435	0.29
Decision-Making Scale (Planning)	2.7 (0.6)	3.4 (0.5)	–3.37	**.002**	1.26

Note: Significant p-values < .05 are bolded.

Columbia Card Task (CCT) Performance

Performance on the Columbia Card Task (CCT) showed a significant group difference in risk-taking behavior. Adolescents with chronic autoimmune disorders selected significantly more cards per round on average in the "hot" version of the CCT than healthy controls, indicating a greater tendency toward risk-seeking under emotionally charged, feedback-driven conditions, as seen in Table 2.

In contrast, group differences on the "cold" version of the task, which assesses more deliberative and analytical decision-making without immediate feedback, were non-significant, suggesting that the risk-prone behavior in the clinical group was more strongly linked to emotional arousal or stress contexts, as seen in Figure 1.

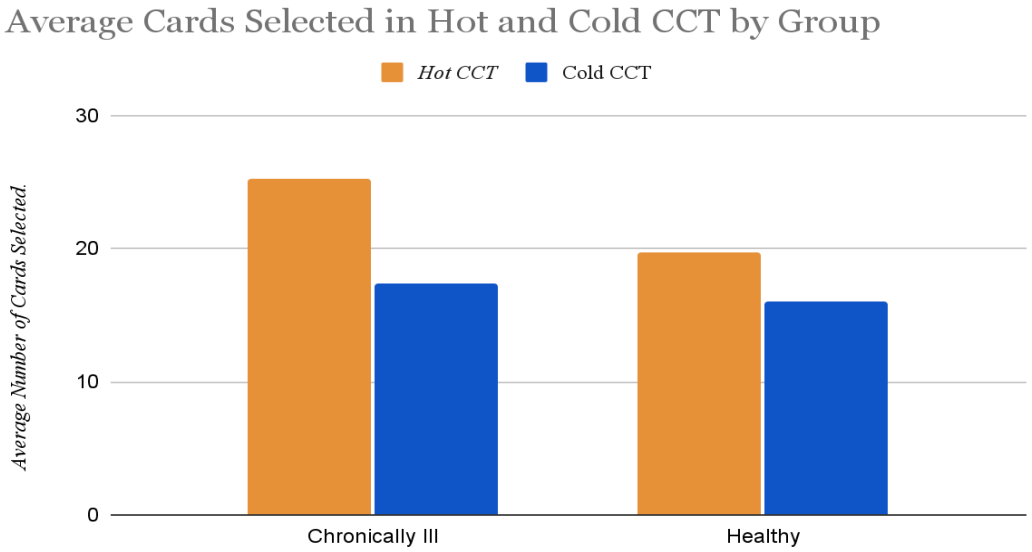
TABLE 2. Descriptive Statistics and Independent Samples t-tests Comparing Chronically Ill and Healthy Adolescents' Performance on the CCT

Measure	Chronically Ill (n = 16)	Healthy Controls (n = 16)	*t*(28)	*p*	Cohen's *d*
CCT Hot Version (Avg. Cards Chosen)	25.2 (4.8)	19.7 (4.1)	3.43	**.002**	1.28
CCT Cold Version (Avg. Cards Chosen)	17.4 (3.9)	16.0 (4.3)	1.18	.248	0.43

Note: Significant p-values < .05 are bolded.

The following bar graph compares average risk-taking behavior between chronically ill and healthy adolescents across the two versions of the Columbia Card Task. Significantly more cards were chosen by the chronically ill group on the hot CCT, indicating increased risk-taking in emotionally charged situations. On the cold CCT, however, no discernible changes were found.

FIGURE 1. Average Number of Cards Selected in Hot and Cold Versions of the Columbia Card Task (CCT) by Group



Source: CCT adapted for adolescent use; task performance recorded via custom online interface.

Correlations

While cognitive reappraisal demonstrated a weak negative link with risk-taking that did not reach significance ($r = –.18$, $p = .34$), expressive suppression was positively correlated with risk-taking on the hot CCT across the entire sample ($r = .41$, $p = .023$). Additionally, impulsive decision-making ($r = .48$, $p = .008$) and expressive suppression ($r = .56$, $p = .002$) were positively correlated with perceived stress.

DISCUSSION

The purpose of this study was to examine how teenagers with autoimmune illnesses and their healthy peers differ in how they regulate their emotions and make decisions. According to the study's hypotheses, adolescents with chronic illnesses demonstrated riskier decision-making tendencies and unique emotional regulation patterns, particularly in emotionally charged, feedback-driven contexts as assessed by the Columbia Card Task (CCT). These behaviors were also marked by a greater reliance on expressive suppression.

As mentioned earlier, one of the primary conclusions was that adolescents with chronic illnesses outperformed the control group on expressive suppression tests. Previous research has shown that chronically ill adolescents often use maladaptive emotional regulation strategies to cope with the psychological and social effects of their condition (Compas et al., 2012; Pinquart & Shen, 2011).

The findings on the decision-making process support the theory that links risky behavior patterns in teenagers to chronic illness. Adolescents with autoimmune disorders made significantly more choices on the hot version of the CCT. This suggests they are more likely to engage in risk-prone behavior when they receive emotionally charged feedback. On the other hand, the cold version of the task (emphasizing non-emotional aspects of decision-making) revealed no group differences

either. This trend means that the risky behavior of the clinical group depends on the situation's context and occurs most in cases where stress or emotions are high.

These results support the idea that chronic illness in adolescents may alter the development of stress-response systems and decision-making processes (Jaser et al., 2012). Adolescents who regularly face health-related stressors may become less aware of certain risks, struggle to think about long-term goals, or rely more on short-term emotional regulation strategies.

Contrary to expectations, cognitive reappraisal scores did not significantly differ between groups, nor did they correlate strongly with CCT performance. Theoretically, teenagers with chronic illnesses can do cognitive reframing just like anyone else. However, when they encounter emotional situations, they may use suppression techniques. This could reduce the benefits of reappraisal. At the same time, the ERQ-CA may not fully capture how reappraisal is applied in stressful situations.

These results have significant implications for the programs that are aimed at helping teens with chronic illnesses. Emotional regulation training that emphasizes positive emotional regulation techniques such as stress inoculation, emotional awareness, and cognitive reappraisal may help in reducing harmful risk-taking (Grey et al., 2009). Also, the education system and health workers should be able to assess that some of the coping mechanisms with emotions that these teenagers use are likely to affect their choice of behavior implementation in social, academic and health contexts (Pedrini et al., 2022).

Limitations

There are several limitations that are to be put into consideration when interpreting these findings. The first limitation is that the small sample size of the study limits generalizability and statistical power. Future research should attempt to confirm these results in larger and more

diverse samples, including participants with more diverse chronic conditions.Additionally, relying on self-reported diagnoses instead of clinical verification may create variability in the makeup of the clinical group. While the Columbia Card Task provides useful insights into risk-related decision-making, it does not capture the full complexity of real-world decisions faced by chronically ill adolescents. Lastly, the qualitative part of the study was analyzed by just one coder, which may limit the depth and objectivity of the thematic interpretations.

Future Directions

Future studies should use longitudinal designs to look at the change in patterns of emotional regulation and tendency to make decisions over time among adolescents with chronic illnesses. Neural and physiological correlates of decision-making under stress in such a population may also be investigated for further knowledge. In addition, experimental interventions on emotion regulation (e.g., cognitive-behavioral interventions, mindfulness-based interventions) could be assessed for their effectiveness in reducing risk-prone decision-making and affecting psychosocial outcomes.

Conclusion

To sum up, the findings of the present study bring to light the fact that adolescents with chronic autoimmune disorders are more likely to engage in risk taking when the scenario is emotionally charged and this effect is mediated specifically through increased dependence on expressive suppression. Together, these findings highlight the importance of including psychosocial interventions aimed at improving capacities for emotion regulation in chronically ill youth to help them engage in healthier choices.

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APPENDICES

Appendix A

Parental Consent and Assent Form: Parental_Consent_and_Assent_Form.pdf

Appendix B

Custom Decision-Making Questionnaire: Adolescent Decision-Making Questionnaire.pdf

Appendix C

Open-ended prompts:

1. Can you describe a moment where you felt overwhelmed or stressed? How did you respond, and what helped you calm down or make a decision in that situation?
2. Think about a situation where you had to make a difficult choice, about something that would affect you in the future. How did you decide what to do?