Title

Repetitive negative thinking as a unique transdiagnostic risk factor for suicidal ideation.

Authors

Caudle, M

Dugas, N

Patel, K

et al.

Publication Date

2024-04-01

DOI

10.1016/j.psychres.2024.115787

Peer reviewed

HHS Public Access

Author manuscript

Psychiatry Res. Author manuscript; available in PMC 2025 April 01.

Published in final edited form as:

Psychiatry Res. 2024 April ; 334: 115787. doi:10.1016/j.psychres.2024.115787.

Repetitive Negative Thinking as a Unique Transdiagnostic Risk Factor for Suicidal Ideation

M. M. Caudle[a], **N. N. Dugas**[b,e], **K. Patel**[b], **R. C. Moore**[c], **M. L. Thomas**[d], **J. Bomyea**[c,e]

[a]San Diego State University/ University of California San Diego Joint Doctoral Program in Clinical Psychology, 6363 Alvarado Court, Suite 103, San Diego, CA 92120, United States

[b]Department of Veteran Affairs Medical Center, 3350 La Jolla Village Dr, San Diego, CA 92161, United States

[c]VA San Diego Center of Excellence for Stress and Mental Health, 3350 La Jolla Village Dr, San Diego, CA 92161, United States

[d]Department of Psychology, Colorado State University, Fort Collins, CO 80525, United States

[e]Department of Psychiatry, University of California, 9500 Gilman Dr, La Jolla, CA 92093, United States

Abstract

Repetitive negative thinking (RNT) is a transdiagnostic symptom observed across mood and anxiety disorders and is characterized by frequent, distressing thoughts that are perceived as uncontrollable. Specific forms of RNT have been linked to increased suicide risk. However, most work examining links between RNT and suicide has been conducted within specific disorders and subtypes of RNT (e.g., rumination in individuals with depression). The present study aimed to investigate associations between transdiagnostic RNT and suicidal ideation. We hypothesized RNT would be associated with suicide risk beyond disorder-specific clinical symptoms. Fifty-four participants with mood, anxiety, and/or traumatic stress disorders completed an interview assessing suicidal risk (Columbia-Suicide Severity Rating Scale (C-SSRS)) and self-report questionnaires assessing transdiagnostic RNT, depression, and anxiety. Based on C-SSRS, we divided participants into high or low suicide risk groups. We analyzed the relationship between suicidal risk group and RNT and found that RNT was uniquely associated with suicidal risk group,

Correspondence concerning this article should be addressed to Jessica Bomyea, PhD, Department of Psychiatry, University of California, San Diego, La Jolla, CA 92037, United States. FAX: 858.534.9450; jbomyea@health.ucsd.edu.

5.5 Authors' contributions

JB, MT, and RCM contributed to conceptualization and funding acquisition. MMC, ND, and KP assisted with project administration. MT contributed to formal analysis. JB, MMC, ND and KP contributed to writing – original draft. MT and RCM contributed to writing – review and editing. All authors contributed to refinement of the study protocol and to the writing of the manuscript and approved the final version of the manuscript.

5.3 Competing interests

Dr. Raeanne C. Moore is a co-founder and has equity interest in KeyWise, Inc. and NeuroUX Inc. The terms of these arrangements have been reviewed and approved by the University of California San Diego in accordance with its conflict of interest policies. No other authors declare that they have competing interests.

5.1 Ethics approval and consent to participate

The present study was approved by the UC San Diego Human Research Protections Program. Before participating, all participants provided written consent to participate after receiving a full written and verbal explanation of the study's aims, procedures, and risk. Participants signed an informed consent before participating in study procedures.

controlling for depression and anxiety severity. Our results suggest including assessments of RNT may have clinical utility for understanding the degree of suicide risk in individuals and point to the potential utility of including clinical interventions to target this symptom for those at high risk of suicide.

Keywords

Internalizing Disorders; Anxiety Disorders; Perseverative Thinking

1. Introduction

Suicide is an urgent public health problem; it is estimated that over 800,000 suicide deaths occur annually, accounting for 1.4% of all deaths worldwide ("Preventing Suicide: A Global Imperative," 2014). Up to 8% of people with mental health disorders will die by suicide (Bradvik, 2018; Inskip et al., 1998; Nordentoft et al., 2011) and those with internalizing disorders seem to be among the highest at risk (Klonsky et al., 2016; Nock et al., 2008). Suicidal ideation is a significant risk factor for suicidal behavior. For example, the conditional probability of ever making an attempt in those with ideation was found to be approximately 29% (i.e., lifetime prevalence of 2.7% among all individuals) and up to 60% of transitions from ideation to attempt occur within the first year of ideation onset (Nock et al., 2008). Individuals with depressive disorders and disorders characterized by anxiety and impulse-control difficulties (i.e., traumatic stress disorders, bipolar, conduct, and substance use disorders) are particularly likely to demonstrate suicidal ideation and behaviors (Nock et al., 2009). Despite the widespread prevalence of suicidal ideation across these psychological disorders, there remains a paucity of data regarding transdiagnostic clinical risk factors of suicidal ideation.

Repetitive negative thinking (RNT) is one potential transdiagnostic risk factor for suicidality. RNT is a maladaptive thought process characterized by frequent, distressing thoughts that are perceived as uncontrollable, including dwelling on past (rumination) and future events (worry) (Ehring et al., 2011; McEvoy et al., 2013). RNT is present across many psychiatric disorders including generalized anxiety disorder (GAD) and major depressive disorder (MDD) (McEvoy et al., 2013). Research suggests transdiagnostic RNT contributes to adverse outcomes of internalizing disorders, as it has been associated with the severity of other clinical symptoms and prospectively predicted the onset and course of mood and anxiety symptoms (Arditte et al., 2016; McEvoy et al., 2013; Raes, 2012; Ruscio et al., 2011; P. Spinhoven et al., 2018; Topper et al., 2014). Specific forms of RNT have been linked to increased suicide risk; for example, a recent meta-analysis concluded that rumination and its subdomains, brooding and reflection, were significantly associated with suicidal ideation (Rogers & Joiner, 2017). In addition, four studies independently found associations between rumination and suicidal ideation in an earlier review (Morrison & O'Connor, 2008). However, most work examining links between RNT and suicide has been conducted within individual disorders or subtypes of RNT rather than examining RNT as a broad transdiagnostic process (Law & Tucker, 2018). The content and temporal orientation of RNT is thought to be disorder-specific (e.g., forward-looking worry prevalent in anxiety

disorders, past-focused rumination prevalent in depression). However, there is evidence that RNT subtypes are driven by a common underlying process (Arditte et al., 2016; Ehring & Watkins, 2008; Ehring et al., 2011; Taylor & Snyder, 2021) that can be characterized by three features – RNT is by nature repetitive and "sticky" to disengage from, continues without providing a clear solution or solving problems and is thus unproductive, and is mentally consuming (Ehring et al., 2011).

Transdiagnostic RNT may be linked to elevated risk for suicide via its adverse downstream effects on both mood and known intermediary risk factors for suicide. Models of suicide risk underscore risk factors related to onset of suicidal ideation and behaviors, such as links between negative thoughts, worsening mood, and suicide (including perseveration specific to negative interpersonal content like burdening others), as well as perceived intractability of negative thinking and feelings of entrapment (Chu et al., 2017; Turecki et al., 2019). Rumination is thought to magnify negative affect and negative cognitions, further increasing rumination (e.g., interactional rumination model (Ciesla, 2007) and the emotional cascade model (Selby & Joiner, 2013)). To the extent that all RNT subtypes are characterized by negative self-referential content characteristic of rumination, RNT as a broader construct may impact suicide risk indirectly via worsening mood. Moreover, a core subjective experience of RNT is the perception that the individual cannot stop the negative thoughts. Feeling caught in a negative thought loop may increase a sense of uncontrollability and internal entrapment. In turn, these feeling may lead to consideration of suicide as a means to escape (Gilbert & Allan, 1998; O'Connor & Kirtley, 2018; Taylor et al., 2011). Consistent with this account, a recent study found that perceptions of entrapment mediate the association between ruminative thinking and self-reported suicide ideation, independent of symptoms of depression and anxiety (Teismann & Forkmann, 2017). Finally, recurrence of thoughts about death, stopping consciousness, and other suicide-specific negative thoughts can themselves be repetitive, intrusive, and perceived as uncontrollable (Baumeister, 1990; Crane et al., 2012). Thus, suicidal ideation may itself reflect a subtype of RNT, which has been described as suicide-specific rumination or perseverative thinking about suicide (Holler et al., 2022; Kerkhof & van Spijker, 2011), such that links between RNT and suicide risk are accounted for by transdiagnostic RNT measures capturing suicide-specific repetitive thinking. To date, relatively little work has examined links between RNT and suicide risk within the framework of these potential risk pathways.

The present study aimed to investigate associations between RNT and suicidal ideation (SI) and behaviors in participants with mood, anxiety, and traumatic stress disorders. RNT is highly prevalent across mood and anxiety disorders that are characterized by elevated suicide risk. However, to date most work examined specific subtypes of RNT within individual disorders (e.g., rumination in individuals with depression), limiting our ability to understand links between the cognitive phenomenon of RNT, agnostic of temporal course and negative thought content, and suicidality. We sought to expand on this literature by evaluating associations between a transdiagnostic RNT measure, the Perseverative Thinking Questionnaire (PTQ; (Ehring et al., 2011)) and history of suicidal ideation and behaviors. We hypothesized that RNT would be uniquely associated with suicide risk above and beyond disorder-specific clinical symptoms. We also explored the previously understudied relationships between RNT's facets (i.e., subscales of the PTQ describing its repetitiveness,

unproductiveness, and mentally taxing nature), suicide-related cognitions, and suicidal ideation. Exploring these relationships with the features of RNT may provide greater nuance in determining the underlying processes leading to suicidal ideation and behavior.

2. Methods

2.1 Participants and Procedure

Participants were recruited from community settings via posted flyers and digital advertisements. All procedures were approved by the UC San Diego Human Research Protections Program and all participants provided written informed consent. Data were collected between 2020 and 2022 as part of a baseline assessment from a larger randomized clinical trial of a novel computer-based working memory intervention program (ClinicalTrials.gov NCT04912089). Inclusion criteria for the parent study included: (1) a score above the clinical cutoff (32+) on the Repetitive Thinking Questionnaire-10 (RTQ-10; (McEvoy et al., 2014)) and (2) meeting diagnostic criteria for a mood, anxiety, or post-traumatic stress disorder, as assessed via the Mini-International Neuropsychiatric Interview (MINI; (Sheehan et al., 1998)). Exclusion criteria for the parent study included: (1) past year diagnosis of severe alcohol use disorder, (2) moderate or greater substance use disorder, (3) lifetime history of a psychotic disorder or bipolar I disorder (4) acute suicidality necessitating immediate clinical intervention, (5) neurodegenerative or neurodevelopmental disorders, (6) history of moderate or severe traumatic brain injury or other known neurological condition, (7) sensory deficits that would preclude completing tasks, (8) conditions unsafe for completing MRI scan, (9) currently receiving psychosocial treatment, (10) currently receiving psychiatric pharmacotherapy, except SSRIs.

Participants completed a brief telephone assessment to provisionally determine eligibility. Potentially eligible participants then completed a baseline evaluation session where they provided written informed consent and completed clinical interviews and self-report questionnaires to confirm final eligibility. Following the baseline evaluation session participants completed additional assessments and procedures reported separately (see NCT04912089 for full trial details). Of the 64 participants who gave informed consent, 8 participants were ineligible due to lifetime psychosis or bipolar I disorder, moderate substance use disorder, or severe alcohol use disorder. Two participants did not meet criteria for any mood, anxiety, or stress related disorder and were also ineligible. One participant declined to continue. After accounting for missing data on individual measures, 52 participants were included in the analyses.

2.2 Measures

The Columbia Suicide Severity Rating Scale (C-SSRS; (Posner et al., 2011)) was used to assess participant's current and past suicidal ideation, as well as their history of suicide attempts. The C-SSRS is a semi-structured interview designed to assess the severity of suicidal ideation and behavior. Consistent with several large-scale studies, individuals were categorized as low- or high risk based on presence or absence of significant lifetime active suicidal ideation (Kessler et al., 2005; Nock et al., 2013), which we defined by ratings of

3 or higher on the C-SSRS (consideration of potential suicide method, presence of suicidal intent, and/or ideation with a plan or intent).

The Perseverative Thinking Questionnaire (PTQ; (Ehring et al., 2011)) is a 15-item self-report measure designed to assess tendencies towards RNT. Participants respond to items such as "The same thoughts keep going through my mind again and again" with a 4-item scale ranging from 0 (*never)* to 4 (*almost always)*. We utilized the total score (possible range 0 – 60) to measure RNT (Cronbach's α = .95). We also explored associations with the PTQ's 3 subscales including *Core Characteristics* (i.e., repetitiveness and intrusiveness of thoughts, difficulty disengaging) (Cronbach's α = .93), *Unproductiveness* (i.e., thoughts continue without producing a solution) (Cronbach's α = .86), *Capturing Mental Capacity* (i.e., thoughts capture attention and cognitive resources) (Cronbach's α = .83).

The Quick Inventory of Depressive Symptomatology Self-Report (QIDS-SR; (Rush et al., 2003)) is a 16-item self-report measure that assesses the severity of depressive symptoms on a scale of 0 to 3, with total scores ranging from 0 to 27 (Cronbach's α = .74).

The Generalized Anxiety Disorder Scale (GAD-7; (Spitzer et al., 2006)) is a 7-item self-reported scale used to screen and assess the severity of anxiety symptoms. The items are rated from 0 (*not at all)* to 3 (*nearly every day)*, resulting in scores ranging from 0 to 21(Cronbach's α = .90).

The Suicide Cognitions Scale-Revised (SCS-R; (Bryan et al., 2021)) is a 16-item self-report measure designed to assess negative thought patterns related to suicide, such as hopelessness and perceived burdensomeness, rated from 0 (s*trongly disagree*) to 4 (s*trongly agree)*, resulting in a summed total score ranging from 0 to 64 (Cronbach's α = .96).

2.3 Statistical Analyses

Analyses were performed using SPSS 28.0. Analysis of variance (ANOVA) and chi-square tests were performed to compare the groups (low- versus high-risk) with respect to demographic and clinical data, with effect sizes reported as eta squared and phi coefficient, respectively. Pearson or point-biserial correlations were performed to explore the relationships between demographic and clinical data with additional metrics of suicidality. Logistic regression was used to investigate our primary question regarding the relationship between RNT and suicide risk after controlling for other clinical variables (i.e., symptoms of depression and anxiety), with OR and Nagelkerke R^2 reported. In addition, we conducted exploratory analyses to examine the extent to which RNT is associated with SI above and beyond suicide-related cognitions, which could be a type of RNT captured in the transdiagnostic measure. Additional exploratory analyses measured relationships between suicide group and the components of RNT captured by the three subscales of the PTQ. Subscales were evaluated separately to identify relationships separately on each, and to avoid potential multicollinearity. To determine suitability of the sample size for our primary analysis, we conducted a power analysis using GPower 3.1 software (Erdfelder et al., 1996) for the primary multiple regression of interest (3 independent variables). Given our sample of 52 and alpha = .05, we need f^2=.16, for >80% power.

3. Results

3.1 Demographic and Clinical Data

Participant characteristics and differences between the low- versus high-risk groups are presented in Table 1. Diagnoses represented in the sample included major depressive disorder (51; 96.2%), panic disorder (19; 35.8%), generalized anxiety disorder (17; 32.1%), posttraumatic stress disorder (11; 20.8%), social anxiety disorder (5;9.4%), and agoraphobia (1; 1.9%). Groups did not differ significantly by education, age (range in years 22–55), or self-reported biological sex. Compared to the low-risk group, the high-risk group endorsed significantly more suicide cognitions (SCS-R), RNT (PTQ), and symptoms of depression (QIDS-SR), but no significant difference in reported anxiety (GAD-7). No participants in the low-risk group endorsed making a past suicide attempt, whereas 36% of participants in the high-risk group had endorsed making a past suicide attempt.

3.2 Bivariate correlations between sociodemographic, clinical, and suicide-related outcomes.

Age and education were not significantly associated with metrics of suicide-related outcomes (Table 2). Current suicide cognitions (SCS-R), RNT (PTQ), symptoms of depression (QIDS-SR), and anxiety (GAD-7) were significantly positively associated with suicide-related outcomes. QIDS-SR, PTQ, and SCS-R were significantly associated with lifetime suicide risk level. However, there were no associations between clinical variables and attempt history. PTQ scores were also correlated with QIDS-SR (r = .56, $p < .001$) and GAD-7 (r = .58, $p < .001$).

3.3 Relationship between clinical data and suicidal ideation

A logistic regression was performed to investigate the effects of QIDS-SR, GAD-7, and PTQ on lifetime suicide risk (Table 3). The model was statistically significant, $\chi^2(3) = 11.860$, $p = .008$. The model explained 27.7% (Nagelkerke R^2) of the variance in suicidal ideation risk level and correctly classified 75% of cases. Based on this assessment, PTQ was found to be significantly related to the odds of suicidal ideation risk level ($p = .02$) above and beyond anxiety ($p = .50$) and depression ($p = .41$) (Table 3).

3.4. Relationship between clinical measures and endorsement of past suicide attempt

A logistic regression was performed to investigate the effects of QIDS-SR, GAD-7, and PTQ on lifetime suicide attempt (yes/no). Neither the model, $\chi^2(3) = 3.643$, $p = .303$, nor the individual clinical variables were significant, $p > .05$. Suicide cognitions was added to the model, and similarly neither the model, $\chi^2(3) = 4.386$, $p = .356$, nor the clinical variables were significant, $p > .05$. Three regression analyses were performed to investigate the effects of the three lower order factors of RNT (i.e., the three subscales of the PTQ: *Core Characteristics*, *Unproductiveness*, *Capturing Mental Capacity)* in separate analyses, controlling for QIDS-SR and GAD-7 on lifetime suicide attempt. None of the three models were significant, nor were their other clinical variables, $p > .05$.

3.5 Exploratory Analyses

3.5.1 Effects controlling for suicide cognitions—A similar logistic regression was performed as stated above, including QIDS-SR, GAD-7, and PTQ, but SCQ-R was added to the model to account for variance in lifetime suicide risk (Table 4). The model was statistically significant, $\chi^2(4) = 19.49$, $p = .001$, and explained 42.5% (Nagelkerke R^2) of the variance in suicidal ideation risk level and correctly classified 82.7% of cases. Based on this assessment, PTQ was linearly associated with suicidal ideation risk level controlling for QIDS-SR, GAD-7, and SCS-R. For every one-point increase in PTQ there was 1.085 times higher odds of exhibiting high-risk suicidal ideation, $p = .041$. As expected, SCS-R also accounted for a significant amount of variance in suicidal ideation risk level, $p = .017$, controlling for QIDS-SR, GAD-7, SCS-R, and PTQ.

3.5.2 Effects on subcomponents of RNT—Three additional logistic regressions were performed to investigate the independent effects of the three lower order factors of RNT; Core Characteristics of RNT, Unproductiveness of RNT, and RNT Capturing Mental Capacity were each included in separate models, controlling for QIDS-SR and GAD-7, to account for variance in lifetime suicide risk level. The Core Characteristics of RNT (Table 5) and Unproductiveness of RNT (Table 6) were significantly associated with suicide risk group, controlling for depression and anxiety; however, RNT Capturing Mental Capacity was not significantly associated with suicide risk group ($p = .365$).

4. Discussion

The purpose of the current study was to examine relationships between history of suicidal ideation and behavior and clinical and sociodemographic features in a group of individuals with internalizing disorders, with a focus on understanding the role of transdiagnostic RNT and its facets. Additionally, we examined the extent to which transdiagnostic RNT was associated with suicidal ideation above and beyond other clinical symptoms and beyond suicide-related cognitions, which could be conceptualized as a type of perseverative cognition captured by the transdiagnostic RNT measure. Results revealed that higher levels of RNT were associated with history of elevated suicidal ideation. Suicidal ideation was also associated with greater depressive symptoms but not anxiety symptoms or sociodemographic characteristics. As hypothesized, results revealed that RNT was associated with suicidal ideation above and beyond the effects of depression and anxiety symptoms and suicide-related cognitions. Exploring the facets of RNT captured by the PTQ subscales found that the perception of unproductiveness of RNT and core characteristics of RNT were most strongly associated with suicidal ideation.

The present findings add to a growing body of research revealing that RNT is associated with increased suicidal ideation. Historically rumination is the most well-studied type of RNT in relation to suicide risk (see for example (Rogers & Joiner, 2017)) though evidence also points to links between suicidal ideation and worry (Gorday et al., 2018; Rogers et al., 2021) and re-experiencing symptoms (Chou et al., 2020; Law et al., 2019). A key limitation in most earlier studies is the use of disorder or content-specific measurement of RNT. In the present study, RNT was captured with a transdiagnostic scale designed to measure key

dysfunctional process-related characteristics, including repetitiveness and perceived futility of thoughts, without alignment to content or timeframe (Ehring et al., 2011). In addition, we included suicide-related cognitions as a covariate to evaluate the possibility that the suicide-related content of cognitions was accounting for relationships between RNT and suicidal ideation. Irrespective of covariate inclusion, PTQ scores were significantly associated with ideation. Earlier observations of consistent relationships between RNT subtypes and suicidal ideation subtypes of RNT together with our findings of similar associations with transdiagnostic RNT support the proposal that the specific *content* of RNT may be less important than the *process* of the thought pattern – i.e., the subjective experience of being caught in an unproductive and uncontrollable cognitive cycle.

Elucidating the mechanistic links between transdiagnostic RNT and suicidal ideation will require future study. One plausible account is that the perception of being trapped in an unproductive cognitive cycle is a key intermediary factor linking RNT to ideation (Teismann & Forkmann, 2017). By this account, individuals with high RNT are plagued by the perception that they are "spinning their wheels" and trapped in a cycle of negative thoughts that fail to solve their problems, which leads to worsening mood, hopelessness, and thoughts of suicide as a means of escaping the cycle. Consistent with this explanation, we found that the perception that repetitive thoughts were *unproductive* was most associated with suicidal ideation. This broadly aligns with prior work showing that perceptions of controllability were most critical in linking specific forms of RNT to suicide (e.g., worry (Gorday et al., 2018) and rumination (Rogers et al., 2021)), as well as models positing that feeling stuck in persistent, negative patterns of interpersonal thinking (perceptions of burdensomeness and isolation) increases suicide risk via hopelessness (Chu et al., 2017; Turecki et al., 2019). Alternatively, it is also possible that a shared diathesis for both RNT and suicidal ideation may be driving observed relationships. Models of RNT suggest it is driven by a breakdown of neurocognitive resources necessary to disengage from negative thoughts (Olatunji et al., 2021; Zetsche & Joormann, 2011). This increased difficulty disengaging from negative thoughts may fuel a self-perpetuating cycle of poor control over negative thought content (RNT), negative affect, and further negative thinking, outlined by the interactional rumination model (Ciesla, 2007; Rogers et al., 2022). Similarly, suicidal ideation and behaviors may be driven by an inability to disengage from negative thoughts and successfully deploy adaptive problem solving (Herzog et al., 2023; Marzuk et al., 2005; Westheide et al., 2008). Thus, future work exploring a potential shared neurocognitive basis will be important to better understand links between RNT and suicide risk.

We did not observe a relationship between RNT and lifetime history of suicide attempt. Others have similarly found that while RNT is associated with ideation, it is not significantly associated with lifetime history of attempts (Gorday et al., 2018; Johnson et al., 2022). This raises an important question regarding the role of RNT, as well as other clinical features more broadly, in predicting risk for suicide-related behaviors. Given that the majority of individuals who contemplate suicide do not go on to act on these thoughts, identification of proximal variables that are informative about the transition from ideation to behavior is critical (Glenn & Nock, 2014). It is possible that RNT does not impact this transition. Alternatively, there may be critical intermediary moderating variables not captured in our analyses – for example, RNT may only increase risk for acting on suicidal thoughts in

the presence of other risk factors (e.g., poor impulse control or social distress). It is also possible that refining our measurement of these constructs, such as by using mobile tools to measure relationships closely in time rather than retrospectively, would be more powerful for detecting any effects that exist.

This study has several limitations that should be considered alongside our findings. First, our dataset was constrained to individuals with mood, anxiety, or traumatic stress disorders who reported elevations in RNT. As a result, the range of RNT will be restricted due to the enrollment criteria so relationships between RNT and other outcomes would likely be attenuated. RNT and suicidal ideation and behavior are prevalent in psychiatric disorders excluded (or not fully represented) in the current sample, such as individuals with borderline personality disorder, bipolar disorder, or psychosis (Hartley et al., 2014; Tang et al., 2021). There is some evidence that relationships between RNT and SI observed in our study might be similar in other clinical groups. For example, associations between RNT and SI have been observed in individuals with bipolar disorder (rumination and reflection were associated with SI (Tang et al., 2021)) and schizophrenia (negative metacognitive beliefs were associated with SI (Hutton et al., 2019)). Nonetheless, these disorders also have unique risk factors as well as level of suicide risk (DeVylder et al., 2015; Villa et al., 2020), so it will be important to determine the extent to which our findings generalize to other clinical disorders. Secondly, most of our sample was composed of college educated females, which limits the generalizability of our findings to other demographic groups. Thirdly, the small sample size, including the small number of individuals with suicidal behavior, may have limited the association between reported past suicide attempts and clinical measures in the present study. Additional studies in larger samples with sufficient representation of individuals with a history of suicidal behaviors are needed to replicate and extend the current findings. Future research may consider including assessments of intermediary constructs closely linked to suicidal behavior to identify risk factors specifically for attempts. One example is capability for suicide - reduced fear of death and increased pain tolerance - which may interact with other risk factors (e.g., negative interpersonal beliefs) to increase risk of suicidal behaviors (Joiner et al., 2009; Van Orden et al., 2008). Finally, our analyses provide a glimpse at the underlying relationship between RNT and suicide with cross-sectional data but cannot speak to how relationships between RNT and suicidal thoughts and behaviors emerge over time. Availability of longitudinal data may help determine the potential for rumination as a reliable predictor of SI in populations with internalizing disorders.

Despite these limitations, our data provide evidence for the role of RNT in understanding individual differences in suicidal ideation within individuals diagnosed with internalizing disorders. Clinically, these data underscore the potential importance of assessing and treating RNT as part of a plan for managing suicide risk. While targeted treatments for transdiagnostic RNT are scarce, cognitive behavioral interventions have shown promise for alleviating RNT (P. Spinhoven et al., 2018). Future work is needed to better understand the relationships between RNT as a transdiagnostic risk factor for suicide and to explore the effect of treatment targeting RNT, alongside other clinical symptoms, on suicide risk.

Acknowledgements

We would like to thank our research assistants, Edith Jimenez, Eshika Mehta, Shirley Feng, Javier Cuevas, Sara Northup, and Keri Tokuhama for their invaluable assistance with recruitment and data collection.

5.6 Funding

Support for this work includes VA CDA Awards (JB IK2-CX001600) and the National institute of Mental Health (JB R61MH127005). The views expressed in this article are those of the authors and do not necessarily reflect the position or policy of the Department of Veterans Affairs or the United States government.

5.2 Availability of data and materials

Data will be made available by the corresponding author upon reasonable request.

References

Arditte KA, Shaw AM, & Timpano KR (2016). Repetitive Negative Thinking: A transdiagnostic correlate of affective disorders. Journal of Social and Clinical Psychology, 35(3), 181–201.

Baumeister RF (1990). Suicide as Escape from Self. Psychological Review, 97(1), 90–113. 10.1037/0033-295x.97.1.90 [PubMed: 2408091]

Bradvik L (2018). Suicide Risk and Mental Disorders. Int J Environ Res Public Health, 15(9). 10.3390/ijerph15092028

Bryan CJ, May AM, Thomsen CJ, Allen MH, Cunningham CA, Wine MD, . . . Russell WA (2021). Psychometric evaluation of the Suicide Cognitions Scale-Revised (SCS-R). Military Psychology, 34(3), 269–279. 10.1080/08995605.2021.1897498 [PubMed: 38536264]

Chou PH, Ito M, & Horikoshi M (2020). Associations between PTSD symptoms and suicide risk: A comparison of 4-factor and 7-factor models. Journal of Psychiatric Research, 129, 47–52. 10.1016/j.jpsychires.2020.06.004 [PubMed: 32563777]

Chu C, Buchman-Schmitt JM, Stanley IH, Hom MA, Tucker RP, Hagan CR, . . . Joiner TE (2017). The interpersonal theory of suicide: A systematic review and meta-analysis of a decade of cross-national research. Psychol Bull, 143(12), 1313–1345. 10.1037/bul0000123 [PubMed: 29072480]

Ciesla JA, & Roberts JE . (2007). Rumination, negative cognition, andtheir interactive effects on depressed mood. Emotion, 7(3), 555–565. 10.1037/1528-3542.7.3.555 [PubMed: 17683212]

Crane C, Shah D, Barnhofer T, & Holmes EA (2012). Suicidal imagery in a previously depressed community sample. Clinical Psychology & Psychotherapy, 19(1), 57–69. 10.1002/cpp.741 [PubMed: 21254309]

DeVylder JE, Lukens EP, Link BG, & Lieberman JA (2015). Suicidal ideation and suicide attempts among adults with psychotic experiences: data from the Collaborative Psychiatric Epidemiology Surveys. JAMA Psychiatry, 72(3), 219–225. 10.1001/jamapsychiatry.2014.2663 [PubMed: 25715312]

Ehring T, & Watkins ER (2008). Repetitive Negative Thinking as a Transdiagnostic Process. International Journal of Cognitive Therapy, 1(3), 192–205. 10.1680/ijct.2008.1.3.192

Ehring T, Zetsche U, Weidacker K, Wahl K, Schonfeld S, & Ehlers A (2011). The Perseverative Thinking Questionnaire (PTQ): validation of a content-independent measure of repetitive negative thinking. J Behav Ther Exp Psychiatry, 42(2), 225–232. 10.1016/j.jbtep.2010.12.003 [PubMed: 21315886]

Erdfelder E, Faul F, & Buchner A (1996). GPOWER: A general power analysis program. Behavior Research Methods Instruments & Computers, 28(1), 1–11. 10.3758/Bf03203630

Gilbert P, & Allan S (1998). The role of defeat and entrapment (arrested flight) in depression: an exploration of an evolutionary view. Psychological Medicine, 28(3), 585–598. 10.1017/s0033291798006710 [PubMed: 9626715]

Glenn CR, & Nock MK (2014). Improving the short-term prediction of suicidal behavior. American Journal of Preventive Medicine, 47(3 Suppl 2), S176–180. 10.1016/j.amepre.2014.06.004 [PubMed: 25145736]

Gorday JY, Rogers ML, & Joiner TE (2018). Examining characteristics of worry in relation to depression, anxiety, and suicidal ideation and attempts. Journal of Psychiatric Research, 107, 97–103. 10.1016/j.jpsychires.2018.10.004 [PubMed: 30384092]

Hartley S, Haddock G, Vasconcelos ESD, Emsley R, & Barrowclough C (2014). An experience sampling study of worry and rumination in psychosis. Psychol Med, 44(8), 1605–1614. 10.1017/S0033291713002080 [PubMed: 23953654]

Herzog S, Keilp JG, Galfalvy H, Mann JJ, & Stanley BH (2023). Attentional control deficits and suicidal ideation variability: An ecological momentary assessment study in major depression. Journal of Affective Disorders, 323, 819–825. 10.1016/j.jad.2022.12.053 [PubMed: 36549341]

Holler I, Teismann T, & Forkmann T (2022). Perseverative Thinking about Suicide Questionnaire (PTSQ): Validation of a new measure to assess suicide-specific rumination. Compr Psychiatry, 112, 152287. 10.1016/j.comppsych.2021.152287 [PubMed: 34781079]

Hutton P, Di Rienzo F, Turkington D, Spencer H, & Taylor P (2019). Suicidal Ideation in People With Psychosis Not Taking Antipsychotic Medication: Do Negative Appraisals and Negative Metacognitive Beliefs Mediate the Effect of Symptoms? Schizophr Bull, 45(1), 37–47. 10.1093/schbul/sby153 [PubMed: 30388270]

Inskip HM, Harris EC, & Barraclough B (1998). Lifetime risk of suicide for affective disorder, alcoholism and schizophrenia. Br J Psychiatry, 172, 35–37. 10.1192/bjp.172.1.35 [PubMed: 9534829]

Johnson SL, Robison M, Anvar S, Swerdlow BA, & Timpano KR (2022). Emotion-related impulsivity and rumination: Unique and conjoint effects on suicidal ideation, suicide attempts, and nonsuicidal self-injury across two samples. Suicide and Life-Threatening Behavior, 52(4), 642–654. 10.1111/sltb.12849 [PubMed: 35257404]

Joiner TE, Van Orden KA, Witte TK, Selby EA, Ribeiro JD, Lewis R, & Rudd MD (2009). Main predictions of the interpersonal-psychological theory of suicidal behavior: empirical tests in two samples of young adults. J Abnorm Psychol, 118(3), 634–646. 10.1037/a0016500 [PubMed: 19685959]

Kerkhof A, & van Spijker B (2011). Worrying and Rumination as Proximal Risk Factors for Suicidal Behaviour. In International Handbook of Suicide Prevention (pp. 199–209). 10.1002/9781119998556.ch12

Kessler RC, Berglund P, Borges G, Nock M, & Wang PS (2005). Trends in suicide ideation, plans, gestures, and attempts in the United States, 1990–1992 to 2001–2003. Jama-Journal of the American Medical Association, 293(20), 2487–2495. 10.1001/jama.293.20.2487

Klonsky ED, May AM, & Saffer BY (2016). Suicide, Suicide Attempts, and Suicidal Ideation. Annu Rev Clin Psychol, 12, 307–330. 10.1146/annurev-clinpsy-021815-093204 [PubMed: 26772209]

Law KC, Allan NP, Kolnogorova K, & Stecker T (2019). An examination of PTSD symptoms and their effects on suicidal ideation and behavior in non-treatment seeking veterans. Psychiatry Research, 274, 12–19. 10.1016/j.psychres.2019.02.004 [PubMed: 30776707]

Law KC, & Tucker RP (2018). Repetitive negative thinking and suicide: a burgeoning literature with need for further exploration. Current Opinion in Psychology, 22, 68–72. 10.1016/j.copsyc.2017.08.027 [PubMed: 28888174]

Marzuk PM, Hartwell N, Leon AC, & Portera L (2005). Executive functioning in depressed patients with suicidal ideation. Acta Psychiatrica Scandinavica, 112(4), 294–301. 10.1111/j.1600-0447.2005.00585.x [PubMed: 16156837]

McEvoy PM, Thibodeau MA, & Asmundson GJG (2014). Trait Repetitive Negative Thinking: A Brief Transdiagnostic Assessment. Journal of Experimental Psychopathology, 5(3), 1–17. 10.5127/jep.037813

McEvoy PM, Watson H, Watkins ER, & Nathan P (2013). The relationship between worry, rumination, and comorbidity: evidence for repetitive negative thinking as a transdiagnostic construct. J Affect Disord, 151(1), 313–320. 10.1016/j.jad.2013.06.014 [PubMed: 23866301]

Morrison R, & O'Connor C (2008). A Systematic Review of the Relationship Between Rumination and Suicidality. Suicide and Life-Threatening Behavior, 38(5), 523–538. 10.1521/suli.2008.38.5.523 [PubMed: 19014305]

Nock MK, Borges G, Bromet EJ, Alonso J, Angermeyer M, Beautrais A, . . . Williams D (2008). Cross-national prevalence and risk factors for suicidal ideation, plans and attempts. Br J Psychiatry, 192(2), 98–105. 10.1192/bjp.bp.107.040113 [PubMed: 18245022]

Nock MK, Green JG, Hwang I, McLaughlin KA, Sampson NA, Zaslavsky AM, & Kessler RC (2013). Prevalence, Correlates, and Treatment of Lifetime Suicidal Behavior Among Adolescents Results From the National Comorbidity Survey Replication Adolescent Supplement. JAMA Psychiatry, 70(3), 300–310. 10.1001/2013.jamapsychiatry.55 [PubMed: 23303463]

Nock MK, Hwang I, Sampson N, Kessler RC, Angermeyer M, Beautrais A, . . . Williams DR (2009). Cross-national analysis of the associations among mental disorders and suicidal behavior: findings from the WHO World Mental Health Surveys. PLoS Med, 6(8), e1000123. 10.1371/journal.pmed.1000123 [PubMed: 19668361]

Nordentoft M, Mortensen PB, & Pedersen CB (2011). Absolute risk of suicide after first hospital contact in mental disorder. Arch Gen Psychiatry, 68(10), 1058–1064. 10.1001/archgenpsychiatry.2011.113 [PubMed: 21969462]

O'Connor RC, & Kirtley OJ (2018). The integrated motivational–volitional model of suicidal behaviour. Philosophical Transactions of the Royal Society B: Biological Sciences, 373(1754). 10.1098/rstb.2017.0268

Olatunji BO, Knowles KA, & Cole DA (2021). A longitudinal trait-state model of attentional control: Implications for repetitive negative thinking. J Affect Disord, 294, 939–948. 10.1016/j.jad.2021.07.105 [PubMed: 34375222]

Posner K, Brown GK, Stanley B, Brent DA, Yershova KV, Oquendo MA, . . . Mann JJ (2011). The Columbia–Suicide Severity Rating Scale: Initial Validity and Internal Consistency Findings From Three Multisite Studies With Adolescents and Adults. American Journal of Psychiatry, 168(12), 1266–1277. 10.1176/appi.ajp.2011.10111704 [PubMed: 22193671]

Preventing Suicide: A Global Imperative. (2014). World Health Organization Library Cataloguing-in-Publication Data. http://apps.who.int/iris/bitstream/10665/131056/1/9789241564779_eng.pdf?ua=1

Raes F (2012). Repetitive Negative Thinking Predicts Depressed Mood at 3-Year Follow-up in Students. Journal of Psychopathology and Behavioral Assessment, 34(4), 497–501. 10.1007/s10862-012-9295-4

Rogers ML, Gorday JY, & Joiner TE (2021). Examination of characteristics of ruminative thinking as unique predictors of suicide-related outcomes. J Psychiatr Res, 139, 1–7. 10.1016/j.jpsychires.2021.05.001 [PubMed: 33992843]

Rogers ML, Jeon ME, Duffy ME, & Joiner TE (2022). Thinking too much: Rumination as a catalyst of the real-time associations between affective states and suicidal ideation. J Consult Clin Psychol, 90(9), 670–681. 10.1037/ccp0000753 [PubMed: 36074616]

Rogers ML, & Joiner TE (2017). Rumination, Suicidal Ideation, and Suicide Attempts: A Meta-Analytic Review. Review of General Psychology, 21(2), 132–142. 10.1037/gpr0000101

Ruscio AM, Seitchik AE, Gentes EL, Jones JD, & Hallion LS (2011). Perseverative thought: a robust predictor of response to emotional challenge in generalized anxiety disorder and major depressive disorder. Behav Res Ther, 49(12), 867–874. 10.1016/j.brat.2011.10.001 [PubMed: 22030295]

Rush AJ, Trivedi MH, Ibrahim HM, Carmody TJ, Arnow B, Klein DN, . . . Keller MB (2003). The 16-Item quick inventory of depressive symptomatology (QIDS), clinician rating (QIDS-C), and self-report (QIDS-SR): a psychometric evaluation in patients with chronic major depression. Biological Psychiatry, 54(5), 573–583. 10.1016/s0006-3223(02)01866-8 [PubMed: 12946886]

Selby EA, & Joiner TE Jr.. (2013). Emotional cascades as prospec-tive predictors of dysregulated behaviors in borderline personality disorder. Personality Disorders, 4(2), 168–174. 10.1037/a0029933 [PubMed: 23046043]

Sheehan DV, Janavs J, Baker R, Harnett-Sheehan K, Knapp E, Sheehan M, . . . Lepine JP (1998). MINI - Mini International Neuropsychiatric Interview - English Version 5.0.0 - DSM-IV. Journal of Clinical Psychiatry, 59, 34–57. 10.4088/JCP.09m05305whi

Spinhoven P, Klein N, Kennis M, Cramer AOJ, Siegle G, Cuijpers P, . . . Bockting CL (2018). The effects of cognitive-behavior therapy for depression on repetitive negative thinking: A meta-

analysis. Behaviour Research and Therapy, 106, 71–85. 10.1016/j.brat.2018.04.002 [PubMed: 29699700]

Spinhoven P, Van Hemert AM, & Penninx BW (2018). Repetitive negative thinking as a predictor of depression and anxiety: A longitudinal cohort study. J Affect Disord, 241, 216–225. 10.1016/j.jad.2018.08.037 [PubMed: 30138805]

Spitzer RL, Kroenke K, Williams JBW, & Lowe B (2006). A brief measure for assessing generalized anxiety disorder - The GAD-7. Archives of Internal Medicine, 166(10), 1092–1097. 10.1001/archinte.166.10.1092 [PubMed: 16717171]

Tang H, Xiong T, Shi J, Chen Y, Liu X, Zhang S, . . . Yao Z (2021). Global and reflective rumination are related to suicide attempts among patients experiencing major depressive episodes. BMC Psychiatry, 21(1), 117. 10.1186/s12888-021-03119-z [PubMed: 33637053]

Taylor MM, & Snyder HR (2021). Repetitive Negative Thinking Shared Across Rumination and Worry Predicts Symptoms of Depression and Anxiety. Journal of Psychopathology and Behavioral Assessment, 43(4), 904–915. 10.1007/s10862-021-09898-9

Taylor PJ, Gooding P, Wood AM, & Tarrier N (2011). The role of defeat and entrapment in depression, anxiety, and suicide. Psychol Bull, 137(3), 391–420. 10.1037/a0022935 [PubMed: 21443319]

Teismann T, & Forkmann T (2017). Rumination, Entrapment and Suicide Ideation: A Mediational Model. Clin Psychol Psychother, 24(1), 226–234. 10.1002/cpp.1999 [PubMed: 26663149]

Topper M, Molenaar D, Emmelkamp PMG, & Ehring T (2014). Are Rumination and Worry Two Sides of the Same Coin? A Structural Equation Modelling Approach. Journal of Experimental Psychopathology, 5(3), 363–381. 10.5127/jep.038813

Turecki G, Brent DA, Gunnell D, O'Connor R,C, Oquendo MA, Pirkis J, & Stanley BH (2019). Suicide and suicide risk. Nat Rev Dis Primers, 5(74). 10.1038/s41572-019-0121-0

Van Orden KA, Witte TK, Gordon KH, Bender TW, & Joiner TE Jr. (2008). Suicidal desire and the capability for suicide: tests of the interpersonal-psychological theory of suicidal behavior among adults. J Consult Clin Psychol, 76(1), 72–83. 10.1037/0022-006X.76.1.72 [PubMed: 18229985]

Villa J, Ehret BC, & Depp CA (2020). Systematic Review of the Inclusion of People With Psychosis in Suicide-Specific Clinical Trials. Crisis, 41(3), 233–236. 10.1027/0227-5910/a000628 [PubMed: 31657642]

Westheide J, Quednow BB, Kuhn KU, Hoppe C, Cooper-Mahkorn D, Hawellek B, . . . Wagner M (2008). Executive performance of depressed suicide attempters: the role of suicidal ideation. European Archives of Psychiatry and Clinical Neuroscience, 258(7), 414–421. 10.1007/s00406-008-0811-1 [PubMed: 18330667]

Zetsche U, & Joormann J (2011). Components of interference control predict depressive symptoms and rumination cross-sectionally and at six months follow-up. J Behav Ther Exp Psychiatry, 42(1), 65–73. 10.1016/j.jbtep.2010.06.001 [PubMed: 20650447]

Table 1

Participant Demographics and Clinical Characteristics of All Participants and between Low- and High-Risk for Suicide Groups

Characteristic	Total N=52	Low-Risk n=20	High-Risk n=32	Statistic
Sex *n* (% Female)	38(0.72)	14(0.7)	24(0.27)	$X^2(1) = 0.05$, $p = 0.831$, $\varphi = -.03$
Age (years)	31(13.83)	32.35(7.77)	30.17(8.29)	$F(1, 51) = 0.9$, $p = 0.348$, $\eta^2 = .02$
Education *n* (%)				$X^2(6) = 7.63$, $p = 0.178$, $\varphi = .38$
< GED	3(0.06)	1(0.05)	2(0.06)	
Highschool/GED	8(0.15)	5(0.25)	3(0.09)	
Certificate	2(0.04)	0(0)	2(0.06)	
Associate Degree	4(0.08)	2(0.1)	2(0.06)	
4-year Degree	25(0.48)	6(0.3)	19(0.59)	
Graduate Degree	10(0.19)	6(0.3)	4(0.13)	
Race *n* (%)				$X^2(4) = 3.834$, $p = 0.429$, $\varphi = .27$
Asian	6(0.11)	2(0.1)	4(0.12)	
Black	3(0.06)	0(0)	3(0.09)	
More than one	8(0.15)	2(0.1)	6(0.18)	
White	32(0.6)	15(0.75)	17(0.52)	
Unknown	4(0.08)	1(0.05)	3(0.09)	
Lifetime Attempt *n* (%)	12(0.23)	0(0)	12(0.36)	$X^2(1) = 9.4$, $p = 0.002$, $\varphi = .42$
SCS-R total	13.62(52)	5.4(9.48)	18.75(13.74)	$F(1, 50) = 14.5$, $p < 0.001$, $\eta^2 = .23$
PTQ total	30.29(11.78)	23.75(11.49)	34.38(10.13)	$F(1, 50) = 12.2$, $p = 0.001$, $\eta^2 = .20$
QIDS-SR total	10.91(4.84)	8.9(4.75)	12.12(4.55)	$F(1, 51) = 6.05$, $p = 0.017$, $\eta^2 = .11$
GAD-7 total	8.66(5.28)	6.9(4.42)	9.73(5.54)	$F(1, 51) = 3.75$, $p = 0.058$, $\eta^2 = .07$
PCL-5 total	29.38(18.87)	21.65(17.73)	34.22(18.17)	$F(1, 51) = 5.91$, $p = 0.019$, $\eta^2 = .11$

Note. SCS-R = Suicide Cognition Scale - Revised, PTQ = Perseverative Thinking Questionnaire, QIDS-SR = Quick Inventory of Depressive Symptoms Self-Report, and GAD-7 = Generalized Anxiety Disorder Scale.

Table 2

Correlations between Clinical Characteristics and Suicidal Ideation and Behavior Outcomes

	Lifetime Suicide Risk	Severity of Past Month Ideation	Severity of Lifetime Ideation	Lifetime Attempt Endorsed
Age (Years)	−0.13	−0.18	−0.23	−0.24
Education	0.05	−0.001	0.03	−0.04
SCS-R	0.47**	0.55**	0.42**	0.21
PTQ	0.44**	0.26	0.46**	0.19
QIDS-SR	0.33*	0.31*	0.39**	0.16
GAD-7	0.26	0.30*	0.28*	0.04

Note.

*Correlation is significant at the 0.05 level (2-tailed)

**Correlation is significant at the 0.01 level (2-tailed); Lifetime suicide risk was coded as 0 (Low-Risk) or 1 (High-Risk), a 1 was coded if the participant endorsed items 3, 4, or 5 on the CSSR-S; SCS-R = Suicide Cognitions Scale-Revised, PTQ = Perseverative Thinking Questionnaire, QIDS-SR = Quick Inventory of Depressive Symptoms Self-Report, and GAD-7 = The Generalized Anxiety Disorder Scale.

Table 3

Logistic Regression Indicates RNT is Independently Associated with Suicidal Ideation Risk Group, Controlling for Depression and Anxiety

	B	SE	*p*	Odds Ratio	95% CI for odds ratio	
QIDS-SR	0.09	0.11	0.41	1.10	0.88	1.36
GAD-7	−0.07	0.10	0.50	0.94	0.77	1.13
PTQ	0.09	0.04	0.02	1.10	1.02	1.19
Constant	−2.65	1.11	0.02	0.07	<0.001	<0.001

Note. PTQ = Perseverative Thinking Questionnaire, QIDS-SR = Quick Inventory of Depressive Symptoms Self-Report, and GAD-7 = The Generalized Anxiety Disorder Scale.

Table 4

Logistic Regression Indicates RNT is Independently Associated with Suicidal Ideation Risk Group, Controlling for Depression, Anxiety, and Suicide Cognitions

	B	SE	*p*	Odds Ratio	95% CI for odds ratio	
QIDS-SR	−0.01	0.13	0.95	0.99	0.77	1.28
GAD-7	−0.10	0.11	0.38	0.91	0.73	1.12
SCS-R	0.11	0.04	0.02	1.11	1.02	1.21
PTQ	0.08	0.04	0.04	1.09	1.00	1.17
Constant	−2.18	1.16	0.06	0.11		

Note. SCS-R = Suicide Cognitions Scale-Revised, PTQ = Perseverative Thinking Questionnaire, QIDS-SR = Quick Inventory of Depressive Symptoms Self-Report, and GAD-7 = The Generalized Anxiety Disorder Scale.

Table 5

Logistic Regression Indicates RNT Core Characteristics are Independently Associated with Suicidal Ideation Risk Group, Controlling for Depression and Anxiety

	B	SE	*p*	Odds Ratio	95% CI for odds ratio	
QIDS-SR	0.11	0.11	0.34	1.11	0.90	1.38
GAD	−0.07	0.10	0.50	0.94	0.77	1.14
RNT Core	0.15	0.06	0.02	1.16	1.02	1.31
Constant	−2.79	1.16	0.02	0.06		

Note. RNT Core = RNT Core Characteristics, QIDS-SR = Quick Inventory of Depressive Symptoms Self-Report, and GAD-7 = The Generalized Anxiety Disorder Scale.

Table 6

Logistic Regression Indicates Unproductiveness of RNT is Independently Associated with Suicidal Ideation Risk Group, Controlling for Depression and Anxiety

	B	SE	*p*	Odds Ratio	95% CI for odds ratio	
QIDS-SR	0.07	0.11	0.52	1.08	0.86	1.34
GAD	−0.02	0.09	0.80	0.98	0.81	1.17
Unprod. RNT	0.35	0.14	0.01	1.43	1.08	1.88
Constant	−2.01	0.92	0.03	0.13		

Note. Unprod. = Unproductiveness, QIDS-SR = Quick Inventory of Depressive Symptoms Self-Report, and GAD-7 = The Generalized Anxiety Disorder Scale.