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The Role of Rumination as a Maladaptive Coping Mechanism in Cases of Comprehensive Anxiety Disorder

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Abstract

Generalized Anxiety Disorder (GAD) is characterized by excessive and persistent worry accompanied by somatic and cognitive symptoms that impair daily functioning. Although rumination has been widely discussed as a form of repetitive negative thinking, its role as a maladaptive coping mechanism sustaining GAD relapse in the context of occupational stress and shift work remains underexplored. This study presents an analytical descriptive case study integrated with a narrative literature review to examine how rumination contributes to symptom maintenance and relapse in GAD. The case involves a 43-year-old female outpatient evaluated at a psychiatric clinic in Surabaya in 2025. The recurrence of anxiety symptoms was precipitated by an early-retirement offer and rotating shift work, which triggered persistent rumination about financial uncertainty. This cognitive process led to insomnia, concentration difficulties, and inconsistent medication adherence, ultimately resulting in symptom relapse. Literature-based interpretation suggests that intolerance of uncertainty (IU) increases vulnerability to rumination, which sustains autonomic hyperarousal and sleep disturbance, while shift work disrupts circadian rhythms and contributes to inconsistent dosing and fluctuating plasma levels of pharmacotherapy. This case highlights a clinically relevant pathway linking occupational uncertainty, rumination, insomnia, and nonadherence in GAD relapse. Comprehensive management should integrate pharmacotherapy, rumination-focused psychotherapy (e.g., CBT or MCT), adherence education, and consideration of workplace-related stressors to reduce recurrence risk.

KEYWORDS

comprehensive anxiety disorder; rumination; intolerance of uncertainty; shift work; medication non-adherence.

Introduction

Generalized Anxiety Disorder (GAD; ICD-10 F41.1) is a chronic anxiety disorder characterized by excessive and uncontrollable worry occurring more days than not for at least six months and accompanied by symptoms such as restlessness, muscle tension, sleep disturbance, and impaired concentration(Association, 2013; World Health Organization, 1992). Epidemiological studies estimate a lifetime prevalence ranging from approximately 3% to 6% globally, with substantial functional impairment and high comorbidity with depressive and somatic disorders (Carleton, 2016a; Strawn, 2018). Beyond emotional distress, GAD is associated with reduced quality of life, occupational dysfunction, increased healthcare utilization, and elevated risk of cardiovascular dysregulation linked to autonomic imbalance (Kemp, 2010). These findings underscore the importance of identifying mechanisms that not only initiate but also maintain and exacerbate GAD symptoms. One transdiagnostic mechanism increasingly recognized in anxiety disorders is rumination, a form of repetitive negative thinking (RNT) characterized by persistent, difficult-to-control

thoughts focused on perceived threats or potential negative outcomes(Meyer et al., 1990; Nolen-Hoeksema et al., 2008; Spitzer et al., 2006; Watkins, 2008). Although traditionally studied in depression, rumination is now understood to overlap substantially with pathological worry and to play a maintaining role in GAD (Newman & Kim, 2023). Experimental and meta-analytic evidence indicates that perseverative cognition, including rumination and worry, prolongs physiological activation by sustaining sympathetic arousal and reducing heart rate variability (HRV), a marker of autonomic regulation (Barlow, 2002; Ottaviani, 2015, 2016). Reduced HRV has consistently been associated with anxiety disorders (Beck & Clark, 1997; Chalmers et al., 2014; Harvey, 2002; Hirsch & Mathews, 2012), suggesting that rumination may contribute to somatic symptoms such as palpitations, tremors, and sleep disturbance through sustained autonomic activation. Moreover, longitudinal findings show that repetitive negative thinking is associated with impaired attention and cognitive performance, further contributing to functional decline (Bai et al., 2025; Dugas & Robichaud, 2007).

A central cognitive vulnerability underlying GAD is Intolerance of Uncertainty (IU), defined as a dispositional incapacity to endure the aversive response triggered by perceived uncertainty (Carleton, 2016). Individuals with high IU tend to interpret ambiguous situations as threatening and engage in maladaptive coping strategies such as worry and rumination in an attempt to anticipate and control potential negative outcomes (Wilson, 2025; Zhou et al., 2024). Empirical models suggest that IU increases rumination, which in turn mediates emotional distress and symptom persistence in anxiety disorders (Uzun, 2025). Within the Contrast Avoidance Model, worry and rumination are conceptualized as strategies that maintain a chronic state of negative affect to avoid abrupt emotional shifts, paradoxically sustaining anxiety and physiological hyperarousal (Kim & Newman, 2023). Thus, IU and rumination together form a cognitive-emotional loop that may explain the chronic and relapsing nature of GAD.

Despite growing evidence on cognitive and neurobiological mechanisms, less attention has been given to how external occupational stressors interact with these internal processes to influence the clinical course of GAD. Shift work, characterized by rotating schedules that disrupt circadian rhythms, has been associated with increased risk of anxiety, insomnia, and mood dysregulation (Borkovec et al., 2004; Wang, 2023). Circadian misalignment affects sleep–wake cycles, hormonal secretion, and autonomic stability, potentially amplifying hyperarousal and cognitive vulnerability. In addition, inconsistent daily routines may interfere with regular medication timing, leading to fluctuating plasma levels of pharmacotherapy and reduced perceived effectiveness (Thayer & Lane, 2000). Medication nonadherence is a recognized contributor to relapse in anxiety disorders, yet the interaction between shift work, rumination, insomnia, and adherence patterns remains insufficiently explored in clinical case literature.

Therefore, this study aims to examine how rumination functions as a maladaptive coping mechanism sustaining symptom recurrence in GAD within the context of occupational uncertainty and shift work. Through an analytical descriptive case study integrated with a narrative literature review, this report seeks to illustrate a clinically meaningful pathway linking intolerance of uncertainty, rumination, autonomic hyperarousal, insomnia, medication nonadherence, and relapse. By integrating cognitive, physiological, and occupational perspectives, this case contributes to a more comprehensive understanding of relapse mechanisms in GAD and highlights implications for multimodal management strategies.

Methods

Study Design

This study employed an analytical descriptive case study design integrated with a narrative literature review. The case study aimed to explore the role of rumination as a maladaptive coping mechanism contributing to symptom maintenance and relapse in Generalized Anxiety Disorder (GAD), while the narrative review was used to contextualize clinical findings within established cognitive and neurobiological models of repetitive negative thinking, intolerance of uncertainty, autonomic regulation, and shift work–related circadian disruption.

Participant and Setting

The participant was a 43-year-old female outpatient (initial code: S.) evaluated at a psychiatric outpatient clinic in Surabaya, Indonesia, in 2025. Identifiable information, including exact dates and institutional details, has been generalized to preserve confidentiality. The patient presented with recurrent anxiety symptoms in the context of occupational stress and rotating shift work.

Data Collection Procedures

Primary clinical data were obtained through structured clinical interviews (autoanamnesis) and collateral information from the spouse (heteroanamnesis). A comprehensive psychiatric assessment was conducted, including mental status examination and functional assessment using the Global Assessment of Functioning (GAF) scale. Clinical information regarding medication history, adherence patterns, occupational changes, and comorbid medical conditions was obtained from medical records and corroborated during interview sessions.

Rumination was identified clinically based on persistent, repetitive, and difficult-to-control negative thoughts focused on occupational and financial uncertainty, occurring daily and interfering with sleep and concentration. Medication adherence patterns were explored by comparing reported dosing consistency before and after the implementation of rotating shift schedules.

Diagnostic Framework

Diagnosis was established using the Indonesian psychiatric classification system (PPDGJ-III), aligned with ICD-10 criteria. The primary diagnosis was Generalized Anxiety Disorder (F41.1). Additional diagnostic considerations included treatment nonadherence (Z91.1), personality traits consistent with Schizotypal Personality Disorder (based on documented patterns of odd beliefs and interpersonal difficulties), and relevant medical comorbidities. Past psychiatric history, including a previous depressive episode with psychotic features and suicidal behavior, was reviewed to clarify longitudinal diagnostic formulation and avoid misclassification.

Narrative Literature Review Approach

To interpret the clinical findings, a thematic narrative literature review was conducted. Relevant peer-reviewed articles were identified through searches of major scientific databases (e.g., PubMed, Scopus, and Google Scholar) using keywords such as “generalized anxiety disorder,” “rumination,” “repetitive negative thinking,” “intolerance of

uncertainty," "heart rate variability," "shift work," "circadian disruption," and "medication adherence." Priority was given to systematic reviews, meta-analyses, and empirical journal articles published in recent years, while seminal theoretical models were also included. The selected literature was analyzed thematically and synthesized to support interpretation of the rumination–hyperarousal–insomnia–nonadherence–relapse pathway observed in the case.

Data Analysis

Clinical data were analyzed descriptively and organized chronologically to identify temporal associations between occupational stressors, rumination patterns, sleep disturbance, medication adherence changes, and symptom recurrence. Literature findings were integrated interpretatively to construct a conceptual model explaining the interaction between cognitive vulnerability (intolerance of uncertainty), maladaptive coping (rumination), physiological activation, circadian disruption, and relapse risk. Mechanistic explanations regarding autonomic regulation and heart rate variability were derived from prior empirical research and were not directly measured in this case.

Ethical Considerations

Written informed consent was obtained from the patient for clinical evaluation and publication of the case report. All identifying information has been anonymized in accordance with confidentiality principles and institutional ethical standards. No financial incentives were provided to the participant.

Methodological Limitations

As a single-case study, findings cannot be generalized to all individuals with GAD. Neurobiological mechanisms, including autonomic markers such as heart rate variability, were not directly measured and are discussed as literature-based interpretations. The narrative review approach does not constitute a systematic review and may be subject to selection bias despite efforts to prioritize high-quality peer-reviewed sources."

Result and Discussion

Case Presentation

Mrs. S., a 43-year-old married female factory worker, presented to a psychiatric outpatient clinic in Surabaya in 2025 with worsening anxiety symptoms over the preceding week. She reported tremors, palpitations, restlessness, difficulty concentrating, and severe sleep disturbance. Symptoms intensified after receiving information about a potential early-retirement offer communicated through her spouse. Since then, she described persistent and intrusive thoughts related to possible job loss and financial instability, occurring daily and particularly at night.

Over the subsequent days, she experienced difficulty initiating and maintaining sleep, sleeping approximately 3–4 hours per night. Daytime fatigue was accompanied by reduced concentration and decreased work performance. She reported spending several hours per day repeatedly thinking about worst-case scenarios regarding employment and family finances.

The patient had been diagnosed with Generalized Anxiety Disorder one year prior and had been treated with fluoxetine and alprazolam with good symptomatic control. However, during the past three months, her workplace implemented a rotating shift system (morning–afternoon–night). Following this schedule change, she began taking medications inconsistently. She reported altering the timing of alprazolam intake, occasionally taking it in the morning to facilitate daytime sleep after night shifts. This resulted in excessive daytime sedation and further disruption of nighttime sleep. Missed and irregular doses became more frequent after the shift rotation began.

Her psychiatric history revealed a major depressive episode with psychotic features in 2020 following COVID-19 infection. During that episode, she experienced auditory hallucinations and suicidal behavior. The episode remitted with combination pharmacotherapy, and psychotic symptoms resolved. Since remission of the depressive episode, persistent anxiety symptoms gradually evolved and were diagnosed as GAD. At the current evaluation, she reported occasional vague auditory perceptual experiences but retained intact reality testing.

Her medical history included gastroesophageal reflux disease (GERD) diagnosed three years earlier, recurrent vertigo, and episodic headaches. She reported that gastrointestinal symptoms worsened during periods of stress.On mental status examination, the patient appeared anxious and cooperative. Mild-to-moderate bilateral hand tremors were observed, particularly when discussing occupational concerns. Speech was coherent and goal-directed. Mood was described as "worried," with an anxious affect of restricted range. Thought content was dominated by persistent concerns about employment, financial security, and health. No active suicidal ideation was reported at the time of examination.

Cognitive assessment showed full orientation to time, place, and person. Immediate attention, assessed using digit span forward, was six digits, indicating intact basic attention capacity; however, sustained concentration during serial tasks was reduced, consistent with subjective complaints of distractibility and sleep deprivation. Insight was partial, and judgment remained intact.
Global functioning assessed using the Global Assessment of Functioning (GAF) scale was estimated at 61–70 at the current visit, compared with a previous documented range of 71–80 during a period of stable treatment one year earlier. Based on PPDGJ-III (aligned with ICD-10), the multiaxial diagnostic formulation was as follows:
Axis I: F41.1 Generalized Anxiety Disorder; Z91.1 Nonadherence to medical treatment
Axis II: Schizotypal Personality Disorder traits
Axis III: Gastroesophageal reflux disease, recurrent vertigo, episodic headaches
Axis IV: Occupational stressors (rotating shift work, potential early retirement)
Axis V: GAF 61–70

This case illustrates a clinically coherent pathway linking cognitive vulnerability, maladaptive coping, physiological arousal, sleep disturbance, medication nonadherence, and symptom relapse in Generalized Anxiety Disorder (GAD). Although based on a single case, the observed clinical trajectory aligns with established cognitive and psychophysiological models of anxiety disorders.

Intolerance of Uncertainty and Rumination as Core Maintenance Mechanisms

A central feature in this case was persistent rumination triggered by occupational uncertainty. Intolerance of Uncertainty (IU) has been consistently identified as a core cognitive vulnerability in GAD, characterized by difficulty tolerating ambiguous or unpredictable situations (Carleton, 2016b). Individuals with elevated IU tend to interpret uncertain events as threatening and engage in repetitive negative thinking as an attempt to anticipate and prevent adverse outcomes (Wilson et al., 2025).

Empirical studies demonstrate that IU predicts worry and

rumination, which in turn mediate emotional distress and symptom persistence in anxiety disorders (Zhou et al., 2024; Uzun et al., 2025). In the present case, the early-retirement offer functioned as a salient uncertainty cue. The patient responded with persistent "what-if" thoughts regarding employment and financial stability, occupying several hours per day and interfering with sleep and occupational functioning.

Within the Contrast Avoidance Model, worry and rumination are conceptualized as strategies that maintain a chronic state of negative affect to prevent abrupt emotional shifts (Kim & Newman, 2023; Newman & Kim, 2023). While intended to reduce uncertainty, this process paradoxically sustains anxiety. The chronic and intrusive nature of the patient's thoughts, coupled with functional impairment, supports the interpretation of rumination as a maintaining rather than merely symptomatic phenomenon.

Rumination, Autonomic Activation, and Cognitive Disruption

Repetitive negative thinking has been associated with prolonged autonomic activation, including increased sympathetic arousal and reduced parasympathetic regulation (Ottaviani et al., 2015; Ottaviani et al., 2016). Meta-analytic evidence indicates that anxiety disorders are characterized by reduced heart rate variability (HRV), reflecting impaired autonomic flexibility (Chalmers et al., 2014; Kemp et al., 2010). Although HRV was not measured in this case, the patient's somatic symptoms—tremors, palpitations, and sleep disturbance—are consistent with sustained physiological arousal described in the literature. Rumination has also been linked to cognitive inefficiency. Longitudinal research suggests that repetitive negative thinking is associated with impaired attention and working memory, potentially due to cognitive resource depletion (Carnevali et al., 2018). In this case, subjective concentration difficulties and reduced work performance emerged concurrently with intensified rumination and insomnia. The interaction between hyperarousal and sleep deprivation likely further amplified cognitive disruption.

Importantly, these physiological and cognitive interpretations are derived from established empirical findings and were not directly measured in this patient. Nonetheless, the temporal association between increased rumination, insomnia, and somatic symptoms supports the plausibility of this mechanism(Watkins, 2016).

Shift Work, Circadian Disruption, and Treatment Instability

An important contextual factor in this case was the introduction of rotating shift work. Shift work disrupts circadian rhythms regulating sleep–wake cycles, hormonal secretion, and autonomic stability, and has been associated with increased risk of anxiety and mood disturbances (Wang et al., 2023). Circadian misalignment may exacerbate insomnia and emotional dysregulation, particularly in individuals with pre-existing anxiety vulnerability.

Beyond its biological impact, shift work interfered with consistent medication timing. SSRIs and benzodiazepines require regular administration to maintain stable plasma levels and therapeutic effects (Strawn et al., 2018). In this case, irregular dosing and altered timing of alprazolam contributed to daytime sedation and further nighttime sleep disruption. Rather than intrinsic pharmacokinetic alteration, inconsistent dosing likely led to fluctuating plasma levels and reduced perceived treatment effectiveness.

Medication nonadherence is a recognized contributor to relapse in anxiety disorders. Behavioral factors, including disrupted routines and sleep disturbance, may reduce adherence consistency. In this case, the shift work schedule created both a psychosocial stressor and a structural barrier to stable pharmacotherapy.

Integrative Relapse Pathway

Taken together, the findings support an integrative relapse pathway:

1. Occupational uncertainty increases intolerance-related distress.
2. Elevated IU triggers persistent rumination.
3. Rumination sustains autonomic hyperarousal and interferes with sleep.
4. Insomnia and cognitive fatigue reduce occupational functioning and medication adherence.
5. Inconsistent dosing contributes to symptom destabilization and relapse.

This pathway integrates cognitive models (Carleton, 2016; Wilson et al., 2025), emotion regulation frameworks (Zhou et al., 2024), psychophysiological evidence (Ottaviani et al., 2016; Chalmers et al., 2014), and circadian research (Wang et al., 2023). The case illustrates how internal cognitive vulnerabilities and external occupational demands interact dynamically to sustain GAD symptoms.

Clinical Implications

The clinical implications are multidimensional. First, pharmacotherapy alone may be insufficient if maladaptive cognitive processes remain unaddressed. Psychotherapeutic approaches targeting rumination and IU—such as Cognitive Behavioral Therapy (CBT) and Metacognitive Therapy (MCT)—may reduce repetitive negative thinking and improve tolerance of uncertainty (Ghaznavi, 2024; Kim & Newman, 2023).

Second, sleep stabilization strategies and psychoeducation regarding medication timing are essential, particularly for patients engaged in rotating shift work. Collaborative problem-solving regarding dosing schedules, adherence reminders, and workplace adjustments may reduce relapse risk.

Third, occupational context should be systematically assessed in GAD management, as environmental stressors may amplify cognitive vulnerabilities and undermine treatment stability.

Limitations

This report describes a single case and cannot establish causal relationships. Autonomic markers such as HRV were not measured; physiological interpretations are based on prior empirical literature. Additionally, the narrative review approach does not substitute for systematic meta-analytic synthesis. Future research examining longitudinal interactions between shift work, rumination, autonomic markers, and adherence patterns would strengthen understanding of relapse mechanisms in GAD.

Conclusion

This case highlights rumination as a clinically significant maintenance mechanism contributing to relapse in Generalized Anxiety Disorder (GAD), particularly when triggered by occupational uncertainty and compounded by shift work–related circadian disruption. The temporal sequence observed—occupational stress, persistent rumination, insomnia, inconsistent medication adherence, and symptom exacerbation—illustrates how cognitive vulnerability and

environmental stressors may interact dynamically to destabilize previously controlled anxiety symptoms.

Rather than functioning merely as a symptom, rumination in this case appeared to operate as a maladaptive coping strategy that sustained physiological arousal, interfered with sleep, and indirectly reduced treatment stability. The presence of rotating shift work further amplified vulnerability by disrupting sleep patterns and medication routines, underscoring the importance of contextual and occupational factors in relapse prevention.

This case supports an integrated treatment approach combining pharmacotherapy, structured interventions targeting rumination and intolerance of uncertainty (e.g., CBT or MCT), adherence-focused psychoeducation, and sleep stabilization strategies. Clinicians should systematically assess occupational stressors and daily routine disruptions in patients with GAD, particularly those presenting with recurrent symptoms despite prior stabilization.

Although causal relationships cannot be established from a single case, this report contributes to a growing body of evidence suggesting that relapse in GAD may emerge from the interaction between repetitive negative thinking and environmental instability. Future longitudinal research incorporating objective physiological markers and adherence monitoring may further clarify these mechanisms and inform targeted relapse-prevention strategies.

Author contributions

Authors explicitly outline and describe their individual contributions to the research and the development of the manuscript. This statement is intended to provide transparency and clarity regarding each author's role in the project. It helps readers and reviewers understand the specific contributions of each author to the research process.

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